

## CHAPTER # 12 ELECTROSTATIC

1. One coulomb is that unit of charge which when placed at 1m from an equal and similar charge repels it with a force
  - a)  $5 \times 10^9$  dyn      b)  $5 \times 10^9$  N
  - c)  $9 \times 10^9$  dyn      d)  $9 \times 10^9$  N
2. The minimum charge on an object is
  - a) 1 coulomb      b) 1 state coulomb
  - c)  $1.6 \times 10^{-19}$       d) None
3. Which of the following is correct
  - a)  $J = C/V$       b)  $J = V \times A$
  - c)  $J = V/A$       d)  $J = C \times V$
4. One electron volt is
  - a)  $1.6 \times 10^{-12}$  ergs      b)  $4.8 \times 10^{-10}$  ergs
  - c) 300 ergs      d) None
5. Polarization of matter is possible only for
  - a) Conductors      b) Insulators
  - c) Gases      d) S. conductors
6. The charge on the electron was calculated by
  - a) Faraday      b) J.J. Thomson
  - c) Millikan      d) Einstein
7. The ink used in the photocopy machine
  - a) Black      b) Blue
  - c) Red      d) Toner
8. There are two charges 1  $\mu$ C and 6  $\mu$ C, the ratio of forces acting on them will be
  - a) 1:25      b) 1:6
  - c) 1:1      d) 6:1
9. An electric field line provides information about \_\_\_\_\_
  - a) Electric Force      b) Direction
  - c) Medium      d) All of them
10. If two charges are experiencing a force of 10 N, when medium is Air, if the medium is changed whose permittivity is '2' then force will be
  - a) 3 N      b) 5 N
  - c) 10 N      d) 0.3 N
11. Unit of electric flux is
  - a) V.m      b) N/C
  - c)  $V.m^2$       d)  $N^2/C^2$
12. Gauss's law can be applied to
  - a) Plane surface      b) Curved surface
  - c) Any surface      d) Closed surface
13. Objects may acquire an excess or deficiency of charge by
  - a) Electric force      b) Heating
  - c) Striking      d) By rubbing
14. Coulomb's law is only applicable for
  - a) Big charges      b) Small charges
  - c) Point charges      d) Any charges
15. The force per unit charge is known as
  - a) Electric flux      b) Electric potential
  - c) Electric intensity      d) Electric current
16. Electric field intensity is also known as
  - a) Electric potential      b) Electric flux
  - c) Potential gradient      d) None
17. A basic technique when applying Gauss's law is to
  - a. Assume the field is constant in direction
  - b. Assume the field is constant in magnitude
  - c. Assume the field is constant in both magnitude and direction
  - d. Construct an imaginary surface about the charge
18. The work done in moving a charge along an equipotential surface is
  - a. Depends on the path taken
  - b. Greater than zero
  - c. Equal to zero
  - d. Negative
19. In the region where the electric field is zero, the electric potential is always
  - a) Positive      b) Negative
  - c) Constant      d) Zero
20. The electric intensity is expressed in unit of N/C or
  - a) Volts      b) Watt
  - c) Joules      d) V/m

21. The energy stored in the capacitor is  
 a)  $\frac{1}{2} CV^2$                       b)  $\frac{1}{2} C^2 V$   
 c)  $\frac{1}{2} QV^2$                       d)  $\frac{1}{2} Q^2V$
22. A charge of 0.01c accelerated through a p.d of 1000v acquires K-E  
 a) 10 J                      b) 100 J  
 c) 200 J                      d) 400 eV
23. If the charge on the particle is double then electric field is  
 a) Half                      b) Double  
 c) Unchanged                      d) None
24. The electric potential at a point of distance 1 m from 2 uc charge is  
 a)  $1.8 \times 10^6 V$                       b)  $1.8 \times 10^6 N/C$   
 c)  $1.8 \times 10^4 V$                       d)  $1.8 \times 10^5 V$
25. Capacity of a capacitor depends upon  
 a. Size of plate  
 b. Distance b/w plates  
 c. Nature of dielectric b/w plates  
 d. All of above
26. The area of plates of 1 farad capacitor separated 8.85mm placed in the air is  
 a)  $10^9 m^2$                       b)  $0^5 m^2$   
 c)  $10^{-9} m^2$                       d)  $10^{-15} m^2$
27. The equation for the stokes law is  
 a)  $6\pi\eta r v$                       b)  $6\pi\eta r \gamma$   
 c)  $6 r v$                       d)  $8\pi\eta r \gamma$
28. A capacitor acts as blocking elements when applied signal is  
 a) A.C                      b) D.C  
 c) Digital                      d) None
29. Inkjet printers works on the principle of  
 a) Electrostatic                      b) Electro dynamics  
 c) Electro magnetism                      d) Electronics
30. The surface consider for gauss's law is called  
 a) Closed surface                      b) Spherical surface  
 c) Gaussian surface                      d) None
31. One giga electron volt  
 a)  $10^6 ev$                       b)  $10^9 ev$   
 c)  $10^{12} ev$                       d)  $10^{15} ev$
32. Gravitational force does not depends on  
 a) Force                      b) Masses  
 c) Distance                      d) Medium
33. Charge to mass ratio was firsts found by  
 a) Millikon                      b) J.J. Thomson  
 c) Newton                      d) None
34. The medium used b/w the plates of capacitor is called  
 a) Polarization                      b) Dielectric  
 c) Insulators                      d) Medium
35. The automobiles wind shield wipers works on  
 a. Electricity  
 b. Cell  
 c. Charging and discharging of capacitor  
 d. None
36. Selenium is a conductor material which when exposed to \_\_\_\_\_  
 a) Light                      b) Dark  
 c) Mono chromatic light                      d) None of these
37. When capacitors are connected in parallel the net capacitance will  
 a) Increase                      b) Decrease  
 c) Constant                      d) None
38. When two capacitors of same capacitance are connected in parallel and then in service, the capacitance in these two cases are in ratio of  
 a) 1:4                      b) 4:1  
 c) 6:1                      d) 1:2
39. S.I unit of permittivity of free space is  
 a) Farad                      b) Weber  
 c)  $C^2/N.m^2$                       d)  $C^2/N.m$
40. A capacitors may be considered as a device for  
 a. Storing energy  
 b. Increasing resistance  
 c. Decreasing resistance  
 d. None

41. If a 10MF and 2000MF capacitors are connected in parallel the net capacitance will be  
 a) 6.7  $\mu\text{F}$                       b) 1990  $\mu\text{F}$   
 c) 2010  $\mu\text{F}$                       d) None
42. A method for charging a conductor without bringing a charge body in contact with it is called  
 a. Magnetization  
 b. Electrification  
 c. Electrostatic induction  
 d. Electromagnetic induction
43. The field inside the hollow conductor will be  
 a) Zero                              b) Greater than zero  
 c)  $E = kq/r^2$                       d) Infinite
44. One volt is  
 a. One joule per coulomb  
 b. One dyne per coulomb  
 c. One Newton per coulomb  
 d. One watt per second
45. If the potential difference on a surface is zero to zero b/w any two points, then the surface is said to be  
 a. A dielectric  
 b. An equipotential surface  
 c. Polarized  
 d. None
46. The electric flux through the surface of hollow sphere containing a point charge at its center depends upon  
 a. Radius of sphere  
 b. Surface area  
 c. Magnitude of charge  
 d. None of these
47. A charge of 2c is in a field of intensity 2N/C, the force on the charge is  
 a) 1 N                              b) 4 N  
 c)  $4\pi$  N                              d) 0 N
48. A line whose tangent at each point is in the direction of electric intensity at that point is called a line of  
 a) Voltage                              b) Electric force  
 c) Charge                              d) Potential field
49. A unit of electric charge is  
 a) Volt                              b) Henrery  
 c) Ampere                              d) Coulomb
50. Potential gradient is defined as  
 a.  $\frac{\Delta E}{\Delta V}$                               b.  $-\frac{\Delta E}{\Delta V}$   
 c.  $\frac{\Delta r}{\Delta V}$                               d.  $-\frac{\Delta V}{\Delta r}$
51. Large CR (Time constant) value has  
 a. Small time constant  
 b. Large time constant  
 c. Equal time constant  
 d. None of these
52. A Capacitor of 2 $\mu\text{F}$  is connected with a battery of 12 Volts, the charge stored in capacitor  
 a.  $2.5 \times 10^{-5}\text{C}$                               b.  $2.4 \times 10^{-6}\text{C}$   
 c.  $2.4 \times 10^{-5}\text{C}$                               d.  $2.4 \times 10^{-6}\text{C}$
53. An electric field can deflect  
 a. X-rays                              b. x – rays  
 c.  $\alpha$  – rays                              d.  $\alpha$  – rays
54. The relative permittivity  $\sum_r$  for germanium is  
 a. 16                              b. 17  
 c. 18                              d. 22
55. Xerography means  
 a. Type writing                              b. Wet writing  
 c. Dry writing                              d. None of these
56. A 25eV electron has a speed of  
 a.  $2 \times 10^6\text{m/sec}$                               b.  $3 \times 10^6\text{m/sec}$   
 c.  $5 \times 10^6\text{m/sec}$                               d.  $4 \times 10^6\text{m/sec}$
57. If mica sheet is place between the plates, the capacity will  
 a. Increase                              b. Decrease  
 c. Remain same                              d. None of these

58. The force exerted by two charged bodies on one another, obeys Coulomb's law provided that
- The charges are not too small
  - The charges are in vacuum
  - The charges are not too large
  - The linear dimension of charges are much smaller than distance between them
59. Coulomb Law is also known as
- Electrostatic Law
  - Force Law
  - Inverse Square Law
  - None
60. The ratio of  $C_{vac}$  and  $C_{med}$  is equal to
- $\Sigma r$
  - $\frac{1}{\Sigma r}$
  - $\frac{1}{\Sigma}$
  - $\frac{1}{\Sigma o}$
61. The ratio of the force between two small spheres with constant charges A) in air, B) in a medium of dielectric constant K is
- $K^2 : 1$
  - $1 : K$
  - $K : 1$
  - $1 : K^2$
62. The force of proton in electric field of magnitude  $10^6$  N/C is
- $1.6 \times 10^{-15}$  N
  - $1.6 \times 10^9$  N
  - $1.6 \times 10^{13}$  N
  - $1.6 \times 10^{13}$  N
63. A cylinder of radius R and length L is placed in a uniform electric field E parallel to the cylindrical axis. The total flux for the surface of the cylinder is:
- $\pi R^2 / E$
  - Zero
  - $2\pi R^2 / E$
  - $2\pi R^2 E$
64. In an inkjet printer the charged ink drops are diverted by the deflection plates
- Towards the charging electrodes
  - Towards the gutter
  - Towards a blank paper on which the print is to be taken
  - In inkjet printer ink can not be charged
65. The constant K in Coulomb's Law depends upon
- Nature of medium
  - System of units
  - Intensity of charge
  - a & b
66. How many electrons are in one Coulomb?
- $6.2 \times 10^{-23}$
  - $6.2 \times 10^{-21}$
  - $1.6 \times 10^{-19}$
  - Zero
67. The force between two charges is 8N. now placed a mica of relative permittivity 4 between two charges as a medium, the force then reduced to
- 2N
  - 4N
  - 6N
  - 8N
68. Selenium is an
- Insulator
  - Conductor
  - Semiconductor
  - Photoconductor
69. Find the potential at a point, where a charge of  $1 \times 10^{-3}$  coulomb is placed at a distance of 10m is
- 1mV
  - 1.9KV
  - 1.6KV
  - 0.15KV
70. In Milikan's experiment, we find the e/m for
- Atom
  - Electron
  - Proton
  - Neutron
71. The charge determined by the Milikan's experiment is
- $\frac{qvd}{m}$
  - $q = \frac{qvd}{g}$
  - $g = \frac{mgd}{v}$
  - None
72. The ratio of electrostatic force to the gravitational force between them is of the order of
- $10^{36}$
  - $10^{38}$
  - $10^{40}$
  - $10^{42}$
73. The magnitude of the electric field on the surface of a sphere of radius 'r' having a uniform surface charge density  $\sigma$  is
- $\frac{\sigma}{\epsilon_0}$
  - $\frac{\sigma}{2\epsilon_0}$
  - $\frac{\sigma}{\epsilon_0 r}$
  - $\frac{\sigma}{2\epsilon_0 r}$
74. Of the following quantities, the one that is vector in character is an electric
- Charge
  - Field
  - Energy
  - Potential Difference

75. Dielectric has the charge of the type inside it
- a) Moving charge      b) Static charge  
c) Both a & b      d) None of these
76. The Coulomb's force between two charges  $q_1$  and  $q_2$  separated by distance 'r' is F. If the separation between two charges is doubled keeping charges constant, then Coulomb's force becomes
- a) 4F      b) F/4  
c) F/2      d) 2F
77. The dimensions of relative permittivity are
- a)  $[A^2T^4ML^{-3}]$       b)  $[ML^{-3}A^2T^4]$   
c)  $[ML^3A^2T^2]$       d) None
78. An alpha particle has twice the charge of a proton. Two protons separated by a distance 'd' exert a force 'F' on each other. What must be the separation between the alpha particles so that they also exert a force 'F' on each other?
- a) 2d      b)  $\frac{d}{2}$   
c)  $\sqrt{2}d$       d)  $\frac{d}{\sqrt{2}}$
79. The ratio of instantaneous charge and maximum charge on plates of capacitors at  $t = RC$  is
- a) 36.8%      b) 63.2%  
c) 20%      d) 30%

### CHAPTER # 13 CURRENT ELECTRICITY

- 1) If the length and diameter of conductor is double, the resistance is
- a) Remain same      b) Double  
c) Half      d) Four time
- 2) The expression for the co-efficient of receptivity is
- a.  $\frac{\Delta R}{R_o \Delta T}$       b.  $\frac{R_2 - R_1}{R_2 \Delta T}$   
c.  $\frac{R_1 - R_2}{R_1 \Delta T}$       d.  $\frac{R_2 - R_1}{R}$
- 3) The reciprocal of resistivity is called
- a) Resistance  
b) Conduction  
c) Conductivity  
d) None
- 4) One coulomb per second is equal to
- a) Joule  
b) Volt  
c) Ampere  
d) Walt
- 5) In the metallic conductor the current is due to flow of charge
- a) Positive  
b) Negative  
c) Proton  
d) None
- 6) Conventional current flow from
- a) Positive to negative  
b) Negative to positive  
c) Negative to negative  
d) None
- 7) The main source for the current are
- a) Two  
b) Three  
c) Four  
d) Five
- 8) The drift velocity of electron at  $0^\circ\text{C}$  is
- a) zero  
b) Maximum  
c) 1 cm/sec  
d) 10 cm/sec

9) In the thermocouple the heat energy is converted into

- a) Mechanical energy
- b) Electric energy
- c) Magnetic energy
- d) None

10) An electric heater 220V, 440W has a resistance

- a)  $2\ \Omega$
- b)  $110\ \Omega$
- c)  $0.5\ \Omega$
- d)  $20\ \Omega$

11) The heating effect of current utilized in

- a) Iron
- b) Tube light
- c) Fan
- d) Motor

12) Mathematical form of ohm's law is

- a)  $I = VR$
- b)  $I = V/R$
- c)  $I = R/V$
- d)  $R = IV$

13) Ohm's law is valid for only current flowing in

- a) Conductors
- b) Transistors
- c) Diodes
- d) Electric Areas

14) Through an electrolyte electric current is passed due to drift of

- a. Free electrons
- b. Positive and negative ions
- c. Free electrons and holes
- d. Protons

15) The e.m.f. of two cells can be compared by

- a. AVO meter
- b. Voltmeter
- c. Potentiometer
- d. Galvanometer

16) The post office box is based on the principle of

- a. Galvanometer
- b. Wheat-stone bridge
- c. Voltmeter
- d. None

17) At null point the current through the galvanometer is

- a) Zero
- b) Maximum
- c) Minimum
- d) None

18) A current of 10A flows in a conductors of  $10\ \Omega$  resistance for 1 mint the heat produce will be

- a)  $10^2\ J$
- b)  $6 \times 10^2\ J$
- c)  $6 \times 10^3\ J$
- d)  $6 \times 10^4\ J$

19) The unit of conductivity is

- a.  $\Omega \cdot M$
- b.  $(\eta \cdot m)^{-1}$
- c.  $\Omega \cdot m^{-1}$
- d. None

20) When the bulb is turned on, ohm's law is applicable

- a) Yes
- b) No
- c) May or may not
- d) None

21) In Series circuit the net resistance is

- a. Increase
- b. Decrease
- c. Remain constant
- d. None

22) Joule law can be expressed as

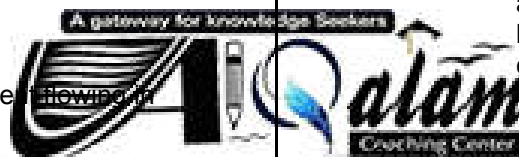
- a)  $I^2 R t$
- b)  $IR^2 t$
- c)  $IRt^2$
- d)  $V^2/R$

23) The graph b/w V and I in case of ohm law is

- a) Parabolic
- b) Curve
- c) Slope
- d) Straight line

24) Resistance of supper conductor is

- a) Finite
- b) Infinite
- c) Zero
- d) Changes with material



25) The e.m.f. of a cell or battery is the voltage b/w its terminals, when

- a. It is closed circuit
- b. It is open circuit
- c. Its internal resistance is zero
- d. None

26) The S.I unit of e.m.f. is same as

- a. Work
- b. Energy
- c. Power
- d. Voltage

27) The main type of resistors are

- a. Two
- b. Three
- c. Four
- d. Five

28) In the carbon resistor their value can be find by their

- a. Wires
- b. Terminals
- c. Color
- d. Spots

29) The third band is written in the form of power of

- a. 2
- b. 6
- c. 8
- d. 10

30) Tolerance color means

- a. Greater
- b. Less
- c. Greater-less
- d. None

31) If the first color red and 2<sup>nd</sup> band is green and third band is orange, then value of resistance is

- a. 20000
- b. 24000
- c. 25000
- d. None

32) If the tolerance color is gold then it value is

- a.  $\pm 2\%$
- b.  $\pm 4\%$
- c.  $\pm 5\%$
- d.  $\pm 6\%$

33) A variable resistors is called

- a. Resistance
- b. Rheostat
- c. Amplifier
- d. None

34) A heat sensitive resistor is called

- a. Amplifier
- b. Diode
- c. Thermistor
- d. Conductor

35) The temperature co-efficient of thermistor is

- a. Positive
- b. Negative
- c. Zero
- d. None

36) Thermistor can be used for the accurate measurement of

- a. Voltage
- b. Resistance
- c. Temperature
- d. Heat

37) A circuit which has only one voltage source is

- a. Network
- b. Simple circuit
- c. Complex circuit
- d. None

38) The circuit who has more than one voltage source is called

- a. Network
- b. Simple circuit
- c. Complex circuit
- d. None

39) The algebraic sum of all the current at junction is zero, is Kirchoff's

- a. 1<sup>st</sup> law
- b. 2<sup>nd</sup> law
- c. 3<sup>rd</sup> law
- d. 4<sup>th</sup> law

40) The algebraic sum of voltages changes around a closed circuit or loop is zero, is Kirchoff's

- a. 1<sup>st</sup> law
- b. 2<sup>nd</sup> law
- c. 3<sup>rd</sup> law
- d. 4<sup>th</sup> law



41) If the resistance of a certain length wire, diameter 5mm is  $10\Omega$  if the diameter is change to 10mm, then new resistance is

- a. 40
- b. 5
- c. 20
- d. 2.5

42) The unit for the consumption of electrical energy commonly used is

- a. Joule
- b. Watt sec
- c. K. watt. hr
- d. Watt. hr

43) Heat generated by 40 watt bulb is one hour is

- a. 24000 J
- b. 48000 J
- c. 144000 J
- d. 14400 J

44) The principle of potentiometer

- a. P.d  $\propto$  length
- b. P.d  $\propto$  resistance
- c. P.d.  $\propto$  area
- d. None

45) A fuse is placed in series with circuit to protect against

- a. High power
- b. High voltage
- c. High current
- d. Over heating

46) If the resistor is traversed apposite to the direction of current, then potential is

- a. Positive
- b. Negative
- c. Zero
- d. None

47) When electricity passes through the liquid then process is called

- a. Electro late
- b. Electrolysis
- c. Electro-conductor
- d. None

48) Which one gives pure nature of the material

- a. Resistively
- b. Conductivity
- c. Temperature co-efficient
- d. None

49) Kirchoff's 1<sup>st</sup> law is also called law of conservation of

- a. Charge
- b. Mass
- c. Energy
- d. None

50. The resistivity of copper in  $\Omega.m$  is

- a.  $1.52 \times 10^{-8}$
- b.  $1.54 \times 10^{-8}$
- c.  $1.56 \times 10^{-8}$
- d. None

51. The wire used in Rheostate is made from

- a. Constanton
- b. Nichrome
- c. Manganin
- d. Tungston

52. An ideal voltmeter would have an infinite

- a. Current
- b. Voltage
- c. Resistance
- d. None of these

53. Open electric transmission lines

- a. Obey Ohm's law
- b. Obey at high temperature
- c. Do not obey Ohm's law
- d. None of these

54. If three resistances of equal resistance R are connected in parallel, the net resistance will

- a. 3R
- b.  $\frac{R}{3}$
- c.  $\frac{3}{R}$
- d. R + 3

55. The fractional change in resistivity per Kelvin

- a. co-efficient in resistance
- b. co-efficient of resistivity
- c. Resistance
- d. None

56. An electric bulb rated at 220V 140watt is connected to 110v power line, the current that flows in it is

- a. 1.27 A
- b. 1.83 A
- c. 2.27 A
- d. 2.83 A





57. Which one is non-ohmic?  
a. Diode                      b. Carbon resistance  
c. Copper wire              d. Tungston wire
58. Magnetic effect of current is utilized in  
a. Iron  
b. Thermocouple  
c. Measurement of current  
d. None
59. The unknown e.m.f can be determined by  
a.  $E_x = \frac{R}{r} E$                       b.  $E_x = E \frac{L}{l}$   
c.  $E_x = E \frac{l}{L}$                       d.  $E_x = \frac{R}{r} lE$
60. Three two ohm resistors are connected to form a triangle. The resistance b/w any two corner is  
a.  $\frac{3}{4} \text{ Ohm}$                       b.  $\frac{4}{3} \text{ Ohm}$   
c.  $4 \times 3 \text{ Ohm}$                       d.  $\frac{4}{3} \text{ Ohm}$
61. The resistivity of a material is  $\rho$  if the area of cross-section of material is doubled and length is halved then the resistivity of material is:  
a)  $\rho$                       b)  $4\rho$   
c)  $2\rho$                       d)  $\rho / 4$
62. Four bulbs of 10W, 20W, 30W and 40W are connected in parallel, the bulb that will shine more is  
a) 10W                      b) 20W  
c) 30W                      d) 40W
63. A source of 200V provides a current of 10.0 Amperes to a house. The power delivered by the source is  
a) 20 watt                      b) 40 watt  
c) 2000 watt                      d) 200 watt
64. When the battery is connected at its ends, an electric field is set up at  
a) Its ends                      b) Every point  
c) Middle                      d) All of them
65. The value of resistance depends upon  
a) Nature                      b) Dimension  
c) Physical state                      d) All of them
66. Conductance is a quantity used to describe the  
a) Physical state of the conductor  
b) Electrical properties of material  
c) Dimension of the conductor  
d) All of them
67. The resistivity  $\rho$  of Aluminium in  $\Omega\text{m}$  is  
a)  $2.59 \times 10^{-8}$                       b)  $2.60 \times 10^{-8}$   
c)  $2.63 \times 10^{-8}$                       d) None of these
68. The resistivity of Germanium in  $\Omega\text{m}$  is  
a)  $0.7 \times 10^{-8}$                       b)  $0.5 \times 10^{-8}$   
c)  $0.59 \times 10^{-8}$                       d) None of these
69. The colour code for the colour Grey is  
a) 7                      b) 8  
c) 9                      d) 5
70. A zero ohm resistor is indicated by  
a) A single silver colour band  
b) A single black band  
c) A silver black band  
d) None of these
71. Thermo couples convert heat energy into  
a) Mechanical energy                      b) Chemical energy  
c) Electrical energy                      d) None of these
72. An accurate measurement of emf of a cell is made by  
a) A voltmeter                      b) An ammeter  
c) A potentiometer                      d) All of them
73. The unknown emf can be determined and given by  
a)  $E_x = \frac{R}{r} E$                       b)  $E_x = E \frac{L}{l}$   
c)  $E_x = E \frac{l}{L}$                       d)  $E_x = \frac{R}{r} lE$
74. Do bends in a wire affect its electrical resistance  
a) Yes                      b) No  
c) Affects a little                      d) None of these

75. A 50 volt battery is connected across a 10 ohm resistor. The current is 4.5A. The internal resistance of the battery is:
- a) 1.1  $\Omega$                       b) 1.2  $\Omega$   
c) 1.3  $\Omega$                       d) 1.4  $\Omega$
76. A 25 watt and 40 watts bulbs were connected in a series to a 220V line. Which electric bulb will grow more brightly?
- a) 25 watts bulb                      b) Neither will give light  
c) Both will have same incandescence  
d) none
77. A 100 watt bulb and a 200 watt bulb are designed to operate at 110V and 220V respectively. The ratio of their resistance is
- a) 1                                      b)  $\frac{1}{2}$   
c)  $\frac{1}{3}$                                       d)  $\frac{1}{4}$

4. A photon while passing through a magnetic field are deflected towards
- a. North pole  
b. South pole  
c. Are ionized  
d. None
5. Iron is what type of magnetic material, it is
- a. Diamagnetic  
b. Paramagnetic  
c. Ferromagnetic  
d. Non-magnetic
6. Magnetism is related to
- a. Stationary charges  
b. Moving charges  
c. Stationary and moving charge  
d. Law of motion
7. If the angle b/w  $\vec{v}$  and  $\vec{B}$  is zero then magnetic force will be
- a. Max  
b. Min  
c. Zero  
d. None



#### CHAPTER # 14 ELECTROMAGNETISM

1. The origin of magnetism is
- a. Iron  
b. Steel  
c. Moving charge  
d. None of these
2. The poles of magnet are similar to
- a. Geo poles  
b. Opposite to geo poles  
c. Perpendicular to geo poles  
d. None
3. A moving charge is surrounded by
- a. 2 fields  
b. 3 fields  
c. 4 fields  
d. None
8. When charge particle enters perpendicular to magnetic field, the path followed by it is
- a. A helix  
b. A circle  
c. Straight line  
d. Ellipse
9. The S.I. unit of magnetic flux is
- a. Tesla  
b. Weber  
c. Joule  
d. Newton
10. Tesla is the unit of
- a. Electric field  
b. Magnetic field  
c. Magnetic field intensity  
d. Electric field intensity
11. It is possible to set a charge at rest into motion with magnetic field

- a. Yes
  - b. No
  - c. Some Time
  - d. None
12. A current carrying conductor carries current away from you the direction of magnetic field with respect to you is
- a. Away from you
  - b. Towards you
  - c. Clock wise
  - d. Anti clockwise
13. The shape of magnetic field around a long straight current carrying wire is
- a. Electrical
  - b. Squire
  - c. Varies with current
  - d. Circular
14. one Tesla is equal to
- a.  $10^4\text{G}$
  - b.  $10^{-4}\text{G}$
  - c.  $10^6\text{G}$
  - d.  $10^{-6}\text{G}$
15. The flux through an area of  $1\text{ m}^2$  in x -y plane in a magnetic filed of 1T directed along Z - axis will be
- a. Zero
  - b. 1 wb
  - c. 0.5 web
  - d. None
16. The toque in the coil can be increased by increasing
- a. No, of tarns
  - b. Current and magnetic field
  - c. Area of coil
  - d. All of above
17. A current carrying loop, when placed in a uniform magnetic field will experience
- a. Electric flux
  - b. Torque
  - c. Magnetic flux
  - d. Force

18. The magnetic flux will be max, for an angle of
- a.  $0^\circ$
  - b.  $60^\circ$
  - c.  $90^\circ$
  - d.  $180^\circ$
19. The Weber and Maxwell are unit of measure of
- a. Conductance
  - b. Electric current
  - c. Magnetic flux
  - d. Electric flux
20. One weber is equal to
- a.  $\text{N.A}^2/\text{A}$
  - b.  $\text{N.m}^2/\text{A}$
  - c.  $\text{N.A}/\text{m}$
  - d.  $\text{N.m}/\text{A}$
21. An electron moves at  $2 \times 10^2\text{m/sec}$  perpendicular to magnetic field of 2T what is the magnitude of magnetic force
- a.  $1 \times 10^{-6}\text{N}$
  - b.  $6.4 \times 10^{-17}\text{N}$
  - c.  $3.6 \times 10^{-24}\text{N}$
  - d.  $4 \times 10^6\text{N}$
22. The waveform of sinusoidal voltage, its frequency and phase can be found by
- a. CRO
  - b. Diode
  - c. Transistor
  - d. Radio
23. The force on a charge particle moving parallel to magnetic field is
- a. Maximum
  - b. Minimum
  - c. Zero
  - d. None
24. The presence of magnetic field around a current carrying conductor was detected by
- a. H. orested
  - b. Ampere
  - c. Weber
  - d. Henry
25. Ampere's law is applicable to



- a. Circular path  
b. Rectangular path  
c. To any path  
d. None

26. The unit of permeability of free space is

- a. T.m/A  
b. T.m<sup>2</sup>/A  
c. T.m/A<sup>2</sup>  
d. None

27. The value of  $\mu_o$  is

- a.  $4 \pi \times 10^{-6}$   
b.  $4 \pi \times 10^{-7}$   
c.  $4 \pi \times 10^{-8}$   
d.  $4 \pi \times 10^{-9}$

28. The magnetic induction of solenoid is

- a.  $\mu_o NI$   
b.  $\mu_o NL$   
c.  $\mu_o N$   
d. None

29. A solenoid of length 500m is wound into 100 turns. A current of 10 A flows in it, the magnetic field intensity is

- a.  $20 \mu_o$   
b.  $200 \mu_o$   
c.  $2000 \mu_o$   
d. None

30. When charge particle enters in the uniform magnetic field, the magnetic force will be balance by

- a. Electric force  
b. Magnetic force  
c. Centripetal force  
d. None

31. The frequency of cyclotron is given by

- a.  $f = \frac{qb}{2\pi m}$

b.  $f = \frac{qb}{2\pi m}$

c.  $f = \frac{qb}{2\pi}$

d.  $\frac{qb}{mr}$

32. the e/m value of electron is

- a.  $1.7588 \times 10^{11}$   
b.  $1.75599 \times 10^{12}$   
c.  $1.7588 \times 10^9$   
d.  $1.7559 \times 10^{14}$

33.  $F = Fe + Fm$  is

- a. Electric force  
b. Magnetic force  
c. Lorentz force  
d. None

34. The main part of C.R.O is

- a. Two  
b. Three  
c. Four  
d. Five



35. In C.R.O. the deflecting plates are

- a. Two  
b. Three  
c. Four  
d. None

36. The material used in fluorescent screen is

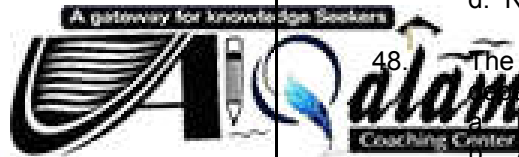
- a. Electric  
b. Magnetic  
c. Phosphors  
d. None

37. The value of restoring torque in galvanometer is

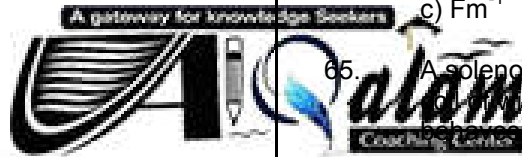
- a.  $\tau = r\theta$   
b.  $\tau = c\theta$   
c.  $\tau = m\theta$   
d. None

38. In the galvanometer the current is proportional to

- a. Magnetic field  
b. Electric field  
c. Angle  
d. None
39. When a small resistance is connected in parallel to the galvanometer it is called
- a. Ammeter  
b. Voltmeter  
c. AVO meter  
d. None
40. To find the shunt resistance we used equation
- a.  $R_s = \frac{I_g R_g}{I - I_g}$   
b.  $R_s = \frac{I_s R_g}{I - I_g}$   
c.  $R_s = \frac{I_g R_s}{R - I_g}$   
d.  $R_s = \frac{I_s R_s}{I - I_g}$
41. To convert a galvanometer into voltmeter we connect a resistance in
- a. Series  
b. Parallel  
c. Series or parallel  
d. None
42. AVO-meter is used to find
- a. Current  
b. Voltage  
c. Resistance  
d. All of above
43. An ideal voltmeter has
- a. Small resistance  
b. High resistance  
c. Infinite resistance  
d. None
44. an ammeter can be more sensitive if C/BAN is made
- a. Very large  
b. Very small  
c. Unaltered  
d. None
45. To increase the scale of galvanometer to twice of its initial value we need to connect a shunt
- a.  $R_s = R_g$   
b.  $R_s < R_g$   
c.  $R_s > R_g$   
d. None
46. Which of the following is a hard magnet?
- a. Iron  
b. Nickel  
c. Steel  
d. All of them
47. Ammeter and galvanometer
- a. Are always connected in series  
b. Are always connected in parallel  
c. Both in series and parallel  
d. None
48. The sensitivity of galvanometer is directly depends on
- a. Magnetic field  
b. Area of coil  
c. Number of turns  
d. All of above
49. One Tesla is also equal to
- a.  $\text{web.m}^2$   
b.  $\text{web.m}^{-2}$   
c.  $\text{web.m}$   
d. None
50. The dot product of magnetic field are area is called
- a. Electric flux  
b. Magnetic flux  
c. Ampere law  
d. None
51. One Henry is equal to
- a.  $\text{V. sec/A}$   
b.  $\text{V.A/sec}$   
c.  $\text{A.sec/V}$   
d. None
52. The S.I unit of Magnetic Permeability is
- a.  $\text{web/m}^2$   
b.  $\text{web A/m}$   
c.  $\text{web m/A}$   
d. None of these



53. Shunt resistor is also called
- By pass resistor
  - Specific resistor
  - Reactance
  - None
54. Synchronization controls of CRO are used to synchronize
- Frequency
  - Current
  - Voltage
  - All of them
55. In C.R.O the anode are at positive potential with respect to cathode is
- very high
  - high
  - low
  - very low
56. The e/m value for an electron is
- $\frac{4v}{Br}$
  - $\frac{Zv}{Br}$
  - $\frac{2v}{B^2 r}$
  - $\frac{2v}{B^2 r^2}$
57. C.R.O is same as
- Radio
  - TV Picture tube
  - Transistor
  - None
58. Heating a magnet will
- Weaken it
  - Strengthen it
  - Reverse its polarity
  - Demagnetize completely
59. Minimum current require to produced a deflection of 1mm on a scale at a distance of 1mm is
- 0.1A
  - 1A
  - current sensitivity
  - 1mA
60. 1 weber = \_\_\_\_\_
- $10^6$  Maxwell
  - $10^8$  Maxwell
  - $10^{10}$  Maxwell
  - none
61. When the number of turns in a solenoid is doubled without any change in the length of the solenoid its self induction will be:
- Four times
  - Doubled
  - Halved
  - None
62. The potential difference across the shunt resistor  $R_s$  is
- $V = I_g R_s$
  - $V = (I - I_g) R_s$
  - $V = (I_g - I) R_s$
  - $V = I_g R_g$
63. In multi range ammeter
- Resistances of different values are connected in series with galvanometer
  - Different resistances are connected in parallel with galvanometer
  - Some resistances are connected in parallel and some of them are connected in series
  - None
64. The S.I unit of magnetic permeability is
- $\text{TmA}^{-2}$
  - $\text{TmA}^{-1}$
  - $\text{Fm}^{-1}$
  - None of these
65. A solenoid is a cylindrical, long and tightly wound wire. When a current pass through it it acts like a
- Source of emf
  - Magnet
  - Electromagnet
  - None of these
66. The brightness of the spot formed on the screen is controlled by the
- Electron
  - Proton
  - Potential
  - None of these
67. Due to radial field, a moving coil galvanometer is
- Comes to rest quickly
  - Magnetic field becomes strong
  - Movement is frequent
  - None of these
68. A very high resistor  $R_h$  is connected in series with the galvanometer in order to convert it into voltmeter
- $\frac{V}{I} - R_g$
  - $\frac{V}{I_g} - R_g$
  - $\frac{I_g}{V} - R_g$
  - $\frac{I}{V} - R_g$



69. Magnetic flux passing normally, through a unit area is called
- Magnetization
  - Magnetic field intensity
  - Magnetic flux density
  - All of these
70. The relation between Tesla ( T ) and Gauss (G) is given as
- $1\text{T} = 10^4\text{G}$
  - $1\text{T} = 10^6\text{G}$
  - $1\text{T} = 10^{-4}\text{G}$
  - $1\text{T} = 10^{-6}\text{G}$
71. Couple necessary to produce unit twist is
- Deflecting couple
  - Restoring couple
  - Torsion couple
  - None of these
72. In velocity selector method, the velocity of an electron is given by
- $v = \sqrt{\frac{2V}{m}}$
  - $v = \sqrt{\frac{3Ve}{m}}$
  - $v = \sqrt{\frac{2V}{me}}$
  - $v = \sqrt{\frac{2Ve}{m}}$
73. The beam of the electrons is provided by
- Ionization of atoms
  - Photoemission
  - Electron gun
  - None of these
74. The resistance of a voltmeter should have a very high resistance
- It does not disturb the circuit
  - It draws some current
  - It same the galvanometer coil
  - None of these
75. The wave form of sinusoidal voltage, its frequency and phase can be found by
- CRO
  - Diode
  - Transistor
  - Radio
76. The shunt resistance connected to a Galvanometer to convert it into a desired level current measuring ammeter is
- $R_s = \frac{V}{I} R_g$
  - $R_s = \frac{V_g}{I - I_g}$

c)  $R_s = \frac{I_g}{I - I_g}$  d) None

77. A vertical solenoid has 200 turns in a length of 0.4m and carries a current of 3A in anticlockwise. The flux density in the middle in Tesla is about
- $6\pi 10^{-4}$
  - $6\pi 10^{-5}$
  - $60\pi 10^{-4}$
  - None



## CHAPTER # 15 ELECTROMAGNETIC INDUCTION

- The induced e.m.f. is produce due to
  - Motion of coil
  - Motion of magnet
  - The rate of change of flux
  - None
- Induced electric current can be explained using which law
  - Gauss's law
  - Faraday's law
  - Ohm's law
  - Ampere law
- In the motional e.m.f. the mechanical energy consumed is converted into
  - Heat energy
  - Internal energy

- c. Steam energy  
d. None
4. Generator works on the principle of
- Torque on rectangular coil
  - Motional e.m.f.
  - Question is wrong
  - None
5. Lenz's law is consistent with law of conservation of
- Mass
  - Energy
  - Charge
  - None
6. An inductor is a circuit element that can store energy in the form of
- Magnetic field
  - Electric flux
  - Electric field
  - None
7. The induced e.m.f. can also be increase by increasing
- Current
  - Voltage
  - No. of turns
  - None
8. The negative sign with induced e.m.f. is due to
- Faraday's law
  - Lenz's law
  - Ampere law
  - None
9. The best way to find the direction of induced e.m.f. in the circuit is
- Faraday's law
  - Lenz's law
  - Ampere's law
  - Right hand rule
10. The relation of motional e.m.f. is
- $E=BLV$
  - $E=qBI$
  - $E=BIq$
  - $E=qVB$

11. If we increase the resistance of coil, the induced e.m.f. will be
- Increase
  - Decrease
  - Remain same
  - None
12. The self-inductance may be defined by
- $L = \frac{-\epsilon}{\Delta I / \Delta t}$
  - $L = \frac{-\Delta I / \Delta t}{\epsilon}$
  - $L = \frac{-\epsilon}{\Delta \phi / \Delta t}$
  - $L = \frac{\epsilon}{\Delta \phi / \Delta t}$
13. The mutual inductance b/w two coil is
- $M = -\epsilon / \Delta I_p$
  - $M = \frac{-\epsilon}{\Delta I_p / \Delta t}$
  - $M = -\epsilon / \Delta \phi / \Delta t$
  - None
14. Inductance are measured by
- Coulombs
  - Amperes
  - Volt
  - Henry
15. The self inductance in case of D.C circuit is
- Maximum
  - Minimum
  - negligible
  - None
16. An over loaded motor draws
- Max. current
  - Min. current
  - Half
  - None
17. The self inductance of a solenoid is
- $L = \mu_o n^2 \frac{\lambda A}{\ell}$
  - $L = \mu_o n \frac{\lambda^2 A}{\ell^2}$
  - $L = \mu_o n l A^2$





$$d) L = \mu_o^2 \frac{n\lambda A}{\ell}$$

18. A current of 7Amp/sec flows a steady rate, through a inductor of inductance 25mh, what is the induced e.m.f?

a) 3.57mv  
b) 175mv  
c) 350mv  
d) None

19. The energy stored in the inductor is

a)  $\frac{1}{2} L I^2$   
b)  $\frac{1}{2} L^2 I$   
c)  $\frac{1}{2} L^2 I^2$   
d) None

20. The energy stored in the inductor per unit volume is

a.  $\frac{IB^2}{2\mu_0}$       b.  $\frac{IB}{2\mu_0}$   
c.  $\frac{IB}{4\mu_0}$       d.  $\frac{IB^2}{4\mu_0}$



21. What energy is stored in an inductor of 40mH, when a current of 8A passing through it

a. 160 mJ  
b. 1.28 J  
c. 1.6 mJ  
d. None

22. Lamination of lamina core of transformer is to decrease its

a. Eddy current  
b. Hysteresis  
c. Electric resistance  
d. Inductance

23. The co-efficient of mutual inductance is equal to

a.  $\in \left( \frac{\Delta I_p}{\Delta t} \right)$       b.  $\in \left( \frac{\Delta t}{\Delta I_p} \right)$

c.  $\in \Delta t \Delta I_p$       d. none

24. Mutual inductance is numerically equal to the e.m.f. induced in the secondary coil when the rate of change of

a. One ampere in secondary coil  
b. Magnetic flux  
c. Current in one ampere in secondary  
d. None

25. Mutual inductance exists

a. Within coil  
b. Out of coil  
c. B/w two coil  
d. None

26. Alternating current changes

a. Its magnitude as well as direction  
b. Only direction but not magnitude  
c. Only magnitude but not direction  
d. None

27. The coil in A.C generator rotates with rotational speed of 10rad/sec its frequency is

a.  $2\pi$  rad/sec  
b.  $5\pi$  rad/sec  
c.  $\frac{5}{\pi}$  rad/sec  
d. None

28. The instantaneous value of A.C. voltage is

a.  $V = V_o \sin 2\pi ft$   
b.  $V = V_o \sin 2\pi wt$   
c.  $V = V_o \sin 2\pi wt$   
d. None

29. In case of A.C. generator the slip rings

a. Move parallel to coil  
b. Are stationary  
c. Move along the direction of coil  
d. None

30. The induced e.m.f. in A.C. generator is

a.  $VBL \sin \phi$   
b.  $NBSN \sin \phi$   
c.  $NAB \sin \phi$   
d.  $NIAB \sin \phi$

- |   |  |
|---|--|
| <p>31. In Pakistan the frequency of A.C. is</p> <ol style="list-style-type: none"> <li>50 Hz</li> <li>100 Hz</li> <li>150 Hz</li> <li>220 Hz</li> </ol> <p>32. The difference b/w A.C. and D.C. generator in due to</p> <ol style="list-style-type: none"> <li>Slip rings</li> <li>Commutators</li> <li>Slip – chip</li> <li>None</li> </ol> <p>33. Two parallel conducting wires placed closer to each other carry current in the same direction will.</p> <ol style="list-style-type: none"> <li>Attract each other</li> <li>Repel each other</li> <li>No effect</li> <li>None of these</li> </ol> <p>34. The back motor effect exist in the</p> <ol style="list-style-type: none"> <li>Generator</li> <li>Mater</li> <li>A.C. Meter</li> <li>None</li> </ol> | <ol style="list-style-type: none"> <li>Motor</li> <li>Transformer</li> <li>None</li> </ol> <p>39. The principle of transformer is</p> <ol style="list-style-type: none"> <li>Amperes law</li> <li>Mutual induction</li> <li>Motional e.m.f.</li> <li>None</li> </ol> <p>40. A transformer is a device which step up or stop down</p> <ol style="list-style-type: none"> <li>Energy</li> <li>Power</li> <li>Voltage</li> <li>All of above</li> </ol> <p>41. The coil which is connected to input is called</p> <ol style="list-style-type: none"> <li>Primary</li> <li>Secondary</li> <li>Middle</li> <li>None</li> </ol> <p>42. In the actual transformer, the output is always</p> <ol style="list-style-type: none"> <li>Equal to input</li> <li>Less then input</li> <li>More than input</li> <li>None</li> </ol> |
|---|--|
- 
- |   |   |
|---|---|
| <p>35. The coil used in the generators is called</p> <ol style="list-style-type: none"> <li>Commutaters</li> <li>Slip rings</li> <li>Armature</li> <li>None</li> </ol> <p>36. The back ward generator is called</p> <ol style="list-style-type: none"> <li>Electric motor</li> <li>A.C. generator</li> <li>Reverse generator</li> <li>None</li> </ol> <p>37. Electric mo0ter are used in</p> <ol style="list-style-type: none"> <li>Television</li> <li>Radar</li> <li>Tape recorder</li> <li>All of above</li> </ol> <p>38. The back e.m.f. exist in the</p> <ol style="list-style-type: none"> <li>Generator</li> </ol> | <p>43. A transformer changes 12V to 1800V and there are 6000 turns in secondary coil, the no of turn on primary coil is</p> <ol style="list-style-type: none"> <li>40</li> <li>20</li> <li>10</li> <li>2</li> </ol> <p>44. In ideal transformer when p.d. in double the current is</p> <ol style="list-style-type: none"> <li>Doubled</li> <li>Tripled</li> <li>Halved</li> <li>Same</li> </ol> <p>45. Power is effectively supplied to primary coil of step up transformer by</p> <ol style="list-style-type: none"> <li>A.C. generator</li> <li>D.C. generator</li> <li>Battery</li> <li>Motor</li> </ol> |
|---|---|



46. An adopter is an example of

- a. Step up transformer
- b. Step down transformer
- c. For both
- d. None

47. The eddy current produced

- a. Power loss
- b. Heating
- c. Both a and b
- d. None

48. To over come the eddy current, the core is

- a. Laminated with insulation
- b. With magnetic
- c. With plastic
- d. None

49. For a good transformer the hysteresis loop are \_\_\_\_\_ in size.

- a. Small
- b. Large
- c. Zero
- d. None

50. To minimize the heating effect in the transmission lines

- a. High current low voltage in used
- b. High voltage low current in used
- c. Same voltage and current in used
- d. None

51. Load is a device which consume

- a. Mechanical energy
- b. Electrical energy
- c. Frictional energy
- d. None

52. Induced e.m.f is

- a. Directly proportional to change in flux
- b. Directly proportional to rate of change of flux
- c. Inversely proportional to change of flux
- d. None of these

53. A transformer is said to be efficient if

- a. Output voltage = Input voltage
- b. Output current = Input current
- c. Output power = Input power
- d. Output energy = Input energy

54. The ratio of e.m.f's of two cells is equal to

- a.  $\frac{\ell_2}{\ell_1}$  b. 1 : 2
- c.  $\frac{\ell_1}{\ell_2}$  d. 2 : 1

55. If a 3cm of wire is moved at right angle to the magnetic field with a speed of 2 miles/sec and if flux density is 5 Tesla, what is the magnitude of induced e.m.f?

- a. 0.03v b. 0.3v
- c. 0.6v d. 10v

56. When a transformer is connected to 120 volt A.C it supplies 3000 volt to device, the current through secondary winding is 0.6 amp and current through primary is 2 amp, the no. of turns on primary is 400. what is the efficiency of transformer?

- a. 75% b. 80%
- c. 85% d. None of these



57. A.C and D.C have same

- a. Effect in charging a capacitor
- b. Effect in charging a battery
- c. Effect while passing through an inductor
- d. Heating effect through a resistor

58. Magnetic compass needle will be deflecting, if it is kept near

- a. Static charge b. Soft iron
- c. Semi conductor d. Accelerating charge

59. When motor is at its Max. speed the back e.m.f will be

- a. Maximum b. Zero
- c. Cannot tell d. None of these

60. Non inductive resistances are used in decreasing

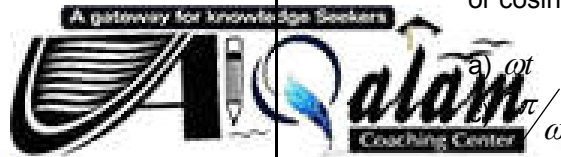
- a. Mutual inductance b. Self inductance
- c. Magnetic field d. Heating effect

61. Self induction is greater in
- AC circuits
  - DC circuits
  - Both in AC & DC
  - None
62. A solenoid of area of cross section  $2.0\text{cm}^2$  and length  $100\text{cm}$  stores energy. When current of  $5.0\text{A}$  flowing in it produces  $B = 0.1\text{T}$  then the stored energy is
- $(10^{-6}/\mu_0)\text{J}$
  - $(10^6/\mu_0)\text{J}$
  - $(10^{-6}/\mu_0)\text{J}$
  - None
63. If the speed of rotation of AC generator is made four times of its initial value, the percentage increase in an induced emf is
- 100%
  - 400%
  - 300%
  - None
64. In mutual induction, the mutual inductance of the two coils depends upon
- Number of turns
  - Area of cross section of coil
  - The distance between the two coils
  - All of them
65. The devices in the circuit that consume electrical energy are known as
- Inductor
  - Capacitor
  - Load
  - None of these
66. The back emf effect in motors changes due to
- Inductance of coils
  - Current
  - Voltage
  - None of these
67. In an ideal transformer, the following factors are used
- Input and output power is same
  - Currents are inversely proportional to voltage
  - Currents are directly proportional to voltage
  - None of these
68. Radio frequency (R.F.) shielding of a coil means to protect from external circuit
- Varying magnetic field
  - Magnetic field
  - Dust and heat
  - Electric field
69. The Jerks are created by the use of
- Commutator
  - Armature
  - Torques
  - None of these
70. The application of mutual induction is a
- Television
  - Radio
  - D.C. motor
  - Transformer
71. If the emf across the conductor of length  $1\text{m}$  moving with a uniform speed at right angles to a magnetic field of  $0.5\text{T}$  is  $2\text{V}$ , the velocity of the conductor is
- $1\text{ ms}^{-1}$
  - $2\text{ ms}^{-1}$
  - $4\text{ ms}^{-1}$
  - $8\text{ ms}^{-1}$
72. What is the self inductance of a coil when a change of current from  $0$  to  $2\text{A}$  in  $0.05\text{sec}$  induces an emf of  $40\text{V}$  in it?
- $1\text{H}$
  - $2\text{H}$
  - $3\text{H}$
  - $4\text{H}$
73. A pair of coils has a mutual inductance of  $2\text{H}$ . If the current in the primary changes from  $10\text{A}$  to zero in  $0.1\text{sec}$ , the induced emf in the secondary will be
- $100\text{V}$
  - $200\text{V}$
  - $300\text{V}$
  - $400\text{V}$
74. A copper ring is held horizontally and bar magnet is dropped through the ring with its length along the axis of the ring. The acceleration of the falling magnet is
- Equal to that due to gravity
  - Less than that due to gravity
  - More than that due to gravity
  - Depends on the diameter of the ring and the length of the magnet
75. An emf of  $0.003\text{V}$  is induced in a wire when it moves at right angles to uniform magnetic field with a speed of  $4\text{m/sec}$  if the length of the wire in the field is  $15\text{cm}$ , what is the flux density in Tesla?
- $0.003$
  - $0.005$
  - $6$
  - $12$
  - $2000$



- d. None
4. In pure resistive A.C. circuit the voltage and current are
- In phase
  - Voltage leads the current
  - Current leads the voltage
  - None
5. The waves which can also pass through the vacuum are
- Matter wave
  - Mechanical wave
  - Electromagnetic wave
  - Transverse wave
6. A battery can pass only steady current through
- Resistors
  - Capacitors
  - Inductors
  - All of above
7. The quality which is called argument of sine or cosine function is

- b)  $2\pi T$   
d)  $\frac{\omega}{2\pi}$



### CHAPTER # 16 ALTERNATING CURRENT CIRCUITS

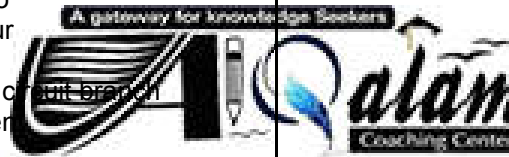
- The A.C. e.m.f. can be represented by the wave form called
  - Sinusoidal
  - Cosine wave
  - Tangent wave
  - None
- The mean value of A.C. over a complete cycle in
  - Maximum
  - Minimum
  - Zero
  - None
- The r.m.s. value of A.C current in
  - $0.707 I_0$
  - $0.707 V_0$
  - $0.708 R_0$

- The unit used for capacitive reactance is
  - Volt
  - Ampere
  - Joule
  - Ohm
- If the frequency of A.C in large the reactance of capacitor is
  - Large
  - Small
  - Zero
  - None
- In case of capacitor, the voltage lags- behind the current by
  - $90^\circ$
  - $60^\circ$
  - $30^\circ$
  - $180^\circ$

- |   |  |
|---|--|
| <p>11. If the capacitance of capacitor is <math>1\mu\text{F}</math> and the frequency of A.C is 50Hz then reactance will be</p> <p>a. 3184<br/>b. 3190<br/>c. 3140<br/>d. 3150</p> <p>12. In the pure inductor the resistance is</p> <p>a. Zero<br/>b. Maximum<br/>c. Minimum<br/>d. None</p> <p>13. The magnitude of back e.m.f. in the inductor is</p> <p>a. <math>\epsilon = L \frac{\Delta I}{\Delta t}</math>      b. <math>\epsilon = L \frac{\Delta I_p}{\Delta t}</math><br/>c. <math>\epsilon = -L \frac{\Delta \phi}{\Delta t}</math>      d. None</p> <p>14. In pure inductive circuit the voltage</p> <p>a. Lead the current by <math>90^\circ</math><br/>b. Ledge the current by <math>90^\circ</math><br/>c. Remain same with current<br/>d. None</p> <p>15. The resistance of inductor is represented by</p> <p>a) <math>X_C</math>                      b) <math>X_L</math><br/>c) <math>R_L</math>                      d) None</p> <p>16. If the frequency of A.C. is double inductor the reactance will be</p> <p>a. Half<br/>b. Same<br/>c. Double<br/>d. Triple</p> <p>17. The average power dissipated in a pure inductor is</p> <p>a. Maximum<br/>b. Minimum<br/>c. Zero<br/>d. None</p> <p>18. The device which is used for controlling A.C. without dissipation of energy is called</p> <p>a. Inductor<br/>b. Capacitor<br/>c. Resistor<br/>d. Choke</p> | <p>19. By increasing the frequency of A.C. through an inductor the reactance will be</p> <p>a. Increases<br/>b. Decreases<br/>c. Remain same<br/>d. None</p> <p>20. In case of phasor diagram the vector rotates</p> <p>a. Clockwise<br/>b. Anti clockwise<br/>c. Remain stationary<br/>d. None</p> <p>21. In case of phasor diagram the velocity vector is called</p> <p>a. Null vector<br/>b. Unit vector<br/>c. Phasor<br/>d. None</p> <p>22. The combine opposition of resistor capacitor and inductor is called</p> <p>a. Reactance<br/>b. Resistor<br/>c. Impedance<br/>d. None</p> <p>23. The S.I unit of impedance is called</p> <p>a) Joule                      b) Weber<br/>c) Ampere                      d) Ohm</p> <p>24. When A.C. flow through RC series circuit the magnitude of voltage is</p> <p>a. <math>V = I\sqrt{R^2 + X_C^2}</math><br/>b. <math>V = I\sqrt{R^2 + X_L^2}</math><br/>c. <math>V = IR</math><br/>d. None</p> <p>25. The impedance of RC – series circuit is</p> <p>a. <math>R = \frac{V}{I}</math><br/>b. <math>Z = \frac{V}{I}</math><br/>c. <math>V = \frac{Z}{I}</math><br/>d. None</p> |
|---|--|

26. The magnitude of voltage in case of RL – service circuit
- $V = I \sqrt{R^2 + XL^2}$
  - $V = I \sqrt{R^2 + Xc^2}$
  - $V = IR$
  - None
27. The average power in case of A.C. series circuit is
- $P = VI$
  - $P = VI \cos \phi$
  - $P = VI \sin \phi$
  - None
28. In equation  $P = VI \cos \phi$ , the factor  $\cos \phi$  is called
- Cosine
  - $\cos \phi$
  - Power factor
  - None
29. At what frequency will a 1H inductor have reactance of 500 ohms
- 80 Hz
  - 60 Hz
  - 40 Hz
  - 20 Hz
30. In case of RLC series circuit the impedance of circuit is
- $Z = R^2 + \sqrt{Xc^2 - XL^2}$
  - $Z = \sqrt{R^2 + XL^2 + Xc^2}$
  - $Z = \sqrt{R^2 + (XL - Xc)^2}$
  - None
31. The behavior of resistance is frequency
- Dependent
  - Independent
  - No, response
  - None of these
32. At resonance frequency the power factor is
- One
  - Zero
  - Two
  - Three
33. The frequency at which  $XL$  is equal to  $Xc$  is called
- Resonance frequency
  - Threshold frequency
  - Non-frequency
  - None
34. At resonance frequency the impedance of A.C series circuit is
- Maximum
  - Minimum
  - Can not explain by give data
  - None
35. In parallel circuit of A.C. there will be maximum
- Power
  - Voltage
  - Impedance
  - None
36. The electrical oscillators are used in
- Metal detectors
  - Amplifier
  - Diode
  - None
37. The current which is produce due to changing electric flux is called
- Displacement current
  - Conduction current
  - Eddy current
  - None
38. The fundamental requirement for the generation of electromagnetic wave is
- Oscillation of electric charge
  - Motion of electric charge
  - Motion of electron
  - None
39. The speed of light was found by formula
- $c = \frac{1}{\sqrt{\sum_o \mu_o}}$
  - $c = s/t$
  - $c = 2 \pi r t$
  - None
40. The super position of sonic wave on EM waves that causes a change in vertical shape of EM waves is
- Frequency Modulation
  - Amplitude Modulation
  - No, effect
  - None
41. For the reception of electromagnetic wave we use a variable
- Resistor
  - Capacitor
  - Inductor
  - None
42. A.M stands for
- Amplitude Modulation
  - Applied Metal
  - Accurate Measurement
  - None

43. F.M stands for
- Frequency Modulation
  - Frequency Metal
  - Frequency Member
  - None
44. The process of combining the low frequency signal with high frequency radio-wave is called
- Modulation
  - Amplification
  - Rectification
  - None
45. Which one give more quality transmission
- A.M
  - F.M
  - S.W
  - M.W
46. An A.C voltmeter reads 250volts, its peak voltage is
- 250v
  - 350.5v
  - 353.5v
  - None of these
47. The types of modulations are
- One
  - Two
  - Three
  - Four
48. In A.C. parallel resonance circuit branch current may be greater than
- Source current
  - e.m.f. current
  - Applied voltage
  - None
49. The angular frequency of resonance circuit is
- $\omega = \frac{1}{\sqrt{LC}}$
  - $\omega = \frac{1}{L\sqrt{C}}$
  - $\omega = \sqrt{LC}$
  - None
50. Natural or Resonant frequency of an LC circuit is
- $\frac{1}{4\pi} \sqrt{LC}$
  - $2\pi \sqrt{LC}$
  - $\frac{1}{2\pi \sqrt{LC}}$
  - $\frac{1}{2\pi} \sqrt{LC}$
51. What is the self inductance of a coil in which an induced e.m.f of 2 volt is setup when current changes at the rate of 4 A/sec.
- 0.5 m H
  - 0.5H
  - 2H
  - 0.5volt
52. When coil of high inductance is used for controlling A.C without dissipation of energy is called
- Inductor
  - Choke
  - Impedance
  - None
53. An A.C choke is a coil consist of thick copper wire, wound closely over a
- Soft iron core
  - Hard iron core
  - Soft iron laminated core
  - None
54. The power consumption in A.C choke is
- Small
  - High
  - Zero
  - Maximum
55. The reciprocal of impedance is called
- Conductance
  - Inductance
  - Admittance
  - None
56. Which one is prefer for transmission of radio signal.
- X – rays
  - Infra red rays
  - Larger than infra red
  - Smaller than infra red
57. Television programs are carried away by
- Low frequency waves
  - High frequency waves
  - Microwaves
  - None
58. When a radio station is broadcasting a musical program, the antenna of its transmitter radiates
- R.F electromagnetic waves
  - A.F electromagnetic waves
  - R.F longitudinal waves
  - A.F longitudinal waves
59. An A.C varies as a function of
- Voltage
  - Current
  - Voltage and current





- d. Time
60. During each cycle A.C voltage reaches its peak value
- a. One time                      b. Two times  
c. Four times                      d. None of these
61. At resonance, the value of the power factor in an LCR series is
- a) Zero                      b)  $\frac{1}{2}$   
c) 1                      d) Not defined
62. In an LCR circuit, if V is the effective value of the applied voltage,  $V_R$  is the voltage across R,  $V_L$  is the effective voltage across L,  $V_C$  is the effective voltage across C, then:
- a)  $V = V_R + V_L + V_C$       b)  $V^2 = V_R^2 + V_L^2 + V_C^2$   
c)  $V^2 = V_R^2 + (V_L - V_C)^2$       d)  $V^2 = V_L^2 + (V_R - V_C)^2$
63. The alternating current transmission for long distances has
- a) Expensive                      b) Low cost  
c) Sometimes both a & b      d) None of these
64. At high frequency the reactance of the capacitor is
- a) Low                      b) Large  
c) Very large                      d) None of these
65. The behaviour of resistance is frequency
- a) Dependent                      b) Independent  
c) No response                      d) None of these
66. In an inductor the phase difference between the current and voltage is
- a) Current lags voltage by  $90^\circ$   
b) Voltage lags current by  $180^\circ$   
c) Current leads voltage by  $90^\circ$   
d) None of these
67. The combined effect a resistance R, an inductance L, a capacitance C is known as
- a) Resistance                      b) Reactance  
c) Impedance                      d) None of these
68. The condition of resonance reached when
- a)  $X_C > X_L$                       b)  $X_L < X_C$   
c)  $X_L = X_C$                       d) None of these
69. The phase difference between coils of three phase A.C is
- a)  $60^\circ$                       b)  $45^\circ$   
c)  $90^\circ$                       d)  $120^\circ$
70. Since there are three coils, the generator has the terminals
- a) Two                      b) Four  
c) Six                      d) Eight
71. Modulation is the process in which
- a) Amplitude is change      b) Frequency is change  
c) Both a & b                      d) None of these
72. The frequency of modulated carrier waves is lowest when signal amplitude is
- a) Maximum negative value  
b) Maximum positive value  
c) Amplitude zero  
d) None of these
73. In a FM broadcast in VHF band channel width is
- a) 75 kHz                      b) 25 kHz  
c) 30 kHz                      d) 200 kHz
74. Find the impedance of an AC circuit when the current flowing in it is 100mA and 10 volts are applied to the circuit.
- a) 500  $\Omega$                       b) 100  $\Omega$   
c) 23  $\Omega$                       d) 20  $\Omega$
75. How many times per second will an incandescent lamp reach maximum brilliance when connected to a 50Hz source?
- a) 50 times                      b) 100 times  
c) 200 times                      d) None of these
76. The peak value of sinusoidal voltage in an AC circuit is 50V. The rms value of voltage is roughly equal to
- a) 70V                      b) 40V  
c) 35V                      d) 45V

77. The magnetic field intensity at a point due to rate of change of electric flux is

- a)  $B = \frac{1}{2\pi r} \frac{\Delta\phi_B}{\Delta t}$       b)  $B = \frac{1}{2\pi r} \frac{\Delta\phi_e}{\Delta t}$   
 c)  $B = \frac{\mu_0 \epsilon_0}{2\pi r} \times \frac{\Delta\phi_e}{\Delta t}$       d)  $B = \frac{1}{2\pi r} \frac{\Delta t}{\Delta\phi_e}$

78. In RLC series AC circuit, when  $X_L = X_C$  then impedance is

- a) Minimum      b) Maximum  
 c) Zero      d) None

4. Which one of the following physical quantities does not have the dimensions of force per unit?

- a) Stress      b) Strains  
 c) Young's modulus      d) Pressure

5. A rubber cord of cross-sectional area  $2\text{cm}^2$  has a length of  $1\text{m}$ . When a tensile force of  $10\text{N}$  is applied, the length of the cord increases by  $1\text{cm}$ . What is the young's modulus of rubber?

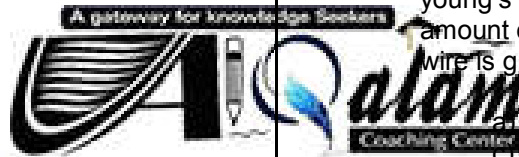
- a.  $2 \times 10^8 \text{ Nm}^{-2}$   
 b.  $5 \times 10^6 \text{ Nm}^{-2}$   
 c.  $0.5 \times 10^{-6} \text{ Nm}^{-2}$   
 d.  $0.2 \times 10^{-6} \text{ Nm}^{-2}$

6. A wire of length  $L$  is stretched by a length  $L$  when a force  $F$  is applied at one end. If the elastic limit is not exceeded, the amount of energy stored in the wire is \_\_\_\_\_

- a)  $FL$       b)  $\frac{1}{2}(FL)$   
 c)  $FL^2/L$       d)  $\frac{1}{2} FL^2/L$

7. When a force is applied at one end of an elastic wire, it produces a strain  $E$  in the wire. If " $y$ " is young's modulus of the material of the wire, the amount of energy stored per unit volume of the wire is given by \_\_\_\_\_

- a)  $YE$       b)  $\frac{1}{2} YE$   
 c)  $YE^2$       d)  $\frac{1}{2} YE^2$



### CHEPTER # 17 PHYSICS OF SOLIDS

1. Which of the following substances possesses the highest elasticity?

- a) Rubber      b) Steel  
 c) Glass      d) Copper

2. What is the S.I unit of modulus of elasticity of substances?

- a.  $\text{Nm}^{-2}$   
 b.  $\text{Jm}^{-2}$   
 c.  $\text{Nm}^{-1}$   
 d. Being number, it has no unit

3. What are the dimensions of stress?

- a)  $\text{MLT}^{-2}$       b)  $\text{ML}^{-2}\text{T}^{-1}$   
 c)  $\text{ML}^{-1}\text{T}^{-2}$       d)  $\text{ML}^0\text{T}^{-1}$

8. A wire, suspended vertically from one end, is stretched by attaching a weight of  $20\text{N}$  to the lower end. The weight stretches the wire by  $1\text{mm}$ . How much energy is gained by the wire?

- a)  $0.01\text{J}$       b)  $0.02\text{J}$   
 c)  $0.04\text{J}$       d)  $1.0\text{J}$

9. A certain stress applied to an elastic material produces a certain strain in it. If the elastic limit is not exceeded, the energy gained per unit volume of the material is given by \_\_\_\_\_

- a) Stress/strain      b)  $\frac{1}{2} (\text{stress} \times \text{strain})$   
 c) Stress  $\times$  strain      d) (stress  $\times$  strain)

10. A uniform steel wire of length  $4\text{m}$  and area of cross section  $3 \times 10^{-6} \text{ m}^2$  is extended by  $1\text{mm}$  by the application of a force. If the young's modulus of steel is  $2 \times 10^{11} \text{ Nm}^{-2}$ , the energy stored in the wire is \_\_\_\_\_

- a) 0.025J                      b) 0.050J  
c) 0.075J                      d) 0.100J
11. The ratio stress to strains in young's modules of the materials then tension is \_\_\_\_\_
- a) Directly proportional to extension  
b) Directly proportional to strains  
c) Directly proportional square of amplitude  
d) Inversely proportional to extension
12. Materials that undergo plastic deformation before breaking are called \_\_\_\_\_
- a) Brittle                      b) Ductile  
c) Amorphous                      d) Polymers
13. A wire is stretched by a force F which causes an extension 1. the energy stored in wire is  $\frac{1}{2} FL$  only if \_\_\_\_\_
- a. The extension of the wire is proportional to the force applied.  
b. The weight of the wire is negligible  
c. The wire is not stretched beyond its elastic limit  
d. The cross sectional area of the wire remains constant
14. Formation of large molecule by joining small molecules is \_\_\_\_\_
- a. Fusion                      b. Polymerization  
c. Crystallization                      d. Subtraction
15. Any alteration produced in shapes, length or volume when a body is subjected to same internal force is called \_\_\_\_\_
- a. Stiffness                      b. Ductility  
c. extension                      d. deformation
16. The energy band occupied by the valence electrons is called \_\_\_\_\_
- a. Energy state                      b. Valence band  
c. -ve energy state                      d. Conduction band
17. The curie temperature is that at which \_\_\_\_\_
- a. Semi conductor becomes conductors  
b. Ferromagnetic becomes paramagnetic  
c. Paramagnetic becomes diamagnetic  
d. Metal becomes super conductor
18. A ferromagnetic will become fully magnetized at

- \_\_\_\_\_
- a. High voltage A.C  
b. Low voltage A.C  
c. Alternating current at its peak value  
d. D.C current is peak value

19. Coercion force is the force which opposes
- a. Demagnetization                      b. Breakage  
c. Extension                      d. Surface cracking
20. Materials in which valence electrons are tightly bound to their atoms at low temperature are called \_\_\_\_\_
- a. Semi conductors                      b. Super conductors  
c. Insulators                      d. Conductors
21. The bulk properties of materials such as their mode of fracture, can be related to their
- a. Polymerization                      b. Cleavage  
c. Microstructure                      d. Dislocation
22. The angular position of cells remains the same for a sample of a crystal this property is called
- a. Isotropy  
b. Cleavage  
c. Homogeneity  
d. The external symmetry of form
23. The breaking of a crystal along definite direction is called
- a. Cleavage                      b. Symmetry  
c. Isotropy                      d. Homogeneity
24. If the density of atoms remains the same along any direction in a crystal is called
- a. Symmetry                      b. Homogeneity  
c. Isotropy                      d. Clearance
25. In simple cube, one atom or molecule lies at its
- a. Four corners                      b. Nine corners  
c. Eight corners                      d. Six corners
26. The band theory of solids explains satisfactorily the nature of
- a. Electrical insulators alone  
b. Electrical conductors alone  
c. Electrical semi conductors alone  
d. All of the above
27. A vacant or partially filled band is called \_\_\_\_\_



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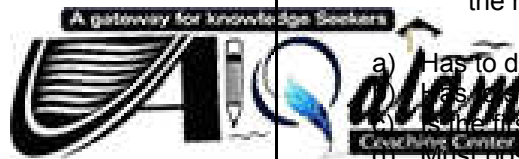
- |   |  |
|---|--|
| <p>a. Conduction band      b. Valence band<br/>c. Forbidden band      d. Empty band</p> <p>28. A completely filled band is called _____<br/>a. Conduction band      b. Valence band<br/>c. Forbidden band      d. Core band</p> <p>29. The electrons in conduction band are free to _____<br/>a. Transport vibrations      b. Transport signals<br/>c. Transport charge      d. Transport impulses</p> <p>30. Which one has the greatest energy gap _____<br/>a. Semi-conductors      b. Conductors<br/>c. Metals      d. Non-metals</p> <p>31. many of the semi conductors are crystals of the type _____<br/>a. Face centered cubic<br/>b. Body centered cubic<br/>c. Simple cubic<br/>d. All of the above</p> <p>32. With increase in temperature, the electrical conductivity of intrinsic semi conductors _____<br/>a. Decreases<br/>b. Increases<br/>c. Remain the same<br/>d. First increases, then decreases</p> <p>33. Holes can exists in _____<br/>a. Conductors      b. insulators<br/>c. semi conductors      d. all of the above</p> <p>34. In a semi conductors, the charge carriers are _____<br/>a. Holes only<br/>b. Electrons only<br/>c. Electrons and holes both<br/>d. All of the above</p> <p>35. The net charge on N-type material is _____<br/>a. Positive      b. Negative<br/>c. Both a &amp; b      d. Neutral</p> <p>36. Very weak magnetic fields are detected by _____<br/>a. Squids</p> | <p>b. Magnetic resonance imaging<br/>c. Magnetometer<br/>d. Oscilloscope</p> <p>37. Energy needed to magnetic and demagnetize is represented by<br/>a. Hysteresis curve      b. Hysteresis loop area<br/>c. Hysteresis loop      d. Straight line</p> <p>38. Pentavalent impurities are called<br/>a. Donor impurities<br/>b. Acceptor impurities<br/>c. Some times donor and some times acceptors<br/>d. None of these</p> <p>39. Minority carriers in N-type materials are<br/>a. Electrons      b. Protons<br/>c. Neutrons      d. Holes</p> <p>40. According to free electron theory the only energy possessed by electron is<br/>a. K.E      b. P.E<br/>c. Gravitational      d. Electrical</p> <p>41. The area under stress – strain graph is<br/>a. Power<br/>b. Energy<br/>c. Momentum      d. Impulse</p> <p>42. Polymers are usually<br/>a. Organic compounds<br/>b. Non-organic compounds<br/>c. Acidic<br/>d. Alkaline</p> <p>43. The resistance against any distortion by solid is<br/>a. Toughness      b. Ductility<br/>c. Stiffness      d. None</p> <p>44. Solid material that are brittle are<br/>a. Toughness      b. Ductile<br/>c. Stiffness      d. None</p> <p>45. The temperature at which conductors lose its resistivity is called<br/>a. Super temperature      b. Kelvin temperature</p> |
|---|--|

- c. Critical temperature d. None
46. The magnetic domains are the small regions of the order of
- a. Millimeter b. Micrometer  
c. Micron d. None
47. A bullet train move with max the speed of
- a. 400 km/hr b. 450 km/hr  
c. 500 km/hr d. 550 km/hr
48. The first super conductor was discovered by
- a. Fermi b. Kmaerling  
c. Weinberg d. None
49. Examples of brittle substances are
- a. Glass b. Copper  
c. Lead d. None
50. Polymers have chemical combination with
- a. Carbon b. Nitrogen  
c. Hydrogen d. All of them
51. Crystalline solids are also
- a. Metals b. Ionic compounds  
c. Ceramics d. All of them
52. Young's Modulus for copper is
- a. 25 b. 55  
c. 100 d. 110
53. When an atom is isolated its energy levels are
- a. Distinct b. Very close  
c. Very very close d. None
54. The valence energy band can never be
- a. Filled b. Partially filled  
c. Empty d. None of these
55. When semiconductor is doped by trivalent, it has
- a. More electrons b. More holes  
c. + ive charge d. - ive charge
56. The field of long bar magnet is like a
- a. Solenoid b. Toroid  
c. Pieces of magnet d. None
57. The curie temperature of Iron is
- a. 600°C b. 650°C  
c. 700°C d. 750°C
58. The examples of diamagnetic are
- a. Water b. Copper  
c. Antimony d. All of them
59. Strain is dimensionless and has
- a. Units b. No units  
c. S.I units d. None
60. How many types of strain are there
- a. One b. Two  
c. Three d. Four
61. The ability of a material to be hammered, pressed, bent, rolled, cut, stretched into useful shape is
- a) Toughness b) Ductility  
c) Stiffness d) None
62. The Young modulus of elasticity is Y. If the forces is increased such that the extension produced becomes double of its initial value then Young Modulus is
- a) Double b) Halved  
c) Unchanged d) None
63. A hydraulic press contains 0.25m<sup>3</sup> oil of bulk modulus  $5.0 \times 10^7$  Pa. The change in volume of oil when subjected to pressure increase of  $1.6 \times 10^7$  Pa is
- a)  $- 8.0 \times 10^{-4} \text{ m}^3$  b)  $4.0 \times 10^{-4} \text{ m}^3$   
c)  $2.0 \times 10^{-4} \text{ m}^3$  d)  $10^{-4} \text{ m}^3$
64. The resistivities of conductors, semiconductors and insulators are of the respective orders of
- a)  $10^8 \Omega.m$ ,  $10^{-4} \Omega.m$   
b)  $10^{-4} \Omega.m$ ,  $10^4 \Omega.m$ ,  $10^8 \Omega.m$   
c)  $10^{-4} \Omega.m$ ,  $10^8 \Omega.m$ ,  $10^4 \Omega.m$   
d)  $10^4 \Omega.m$ ,  $10^{-4} \Omega.m$ ,  $10^8 \Omega.m$
65. Diamagnetic needle when placed between the poles of a magnet align itself in the direction
- a) Parallel to B b) Anti parallel to B  
c) Perpendicular to B d) None

66. Crystalline solids are also  
 a) Metals                      b) Ionic compounds  
 c) Ceramics                  d) All of them
67. With the rise of temperature the amplitude of atoms  
 a) Slow down                  b) Fixed  
 c) Increases                  d) None of these
68. Crystal lattice is a repetition of  
 a) Atoms                      b) Molecules  
 c) Unit cell                   d) All of them
69. Polymers have chemically combinations with  
 a) Carbon                      b) Nitrogen  
 c) Hydrogen                  d) All of them
70. If the stress increased on a material is beyond the yield strength of the material is called  
 a) Plasticity                  b) Elasticity  
 c) Still in elasticity          d) None of these
71. Examples of brittle substances are  
 a) Glass                      b) Copper  
 c) Lead                        d) None of these
72. Semiconductor materials have the conductivities generally lies between  
 a)  $10^{-5}$  to  $10^{-6} (\Omega.m)^{-1}$     b)  $10^{-6}$  to  $10^{-4} (\Omega.m)^{-1}$   
 c)  $10^{-7}$  to  $10^{-3} (\Omega.m)^{-1}$     d) None of these
73. The electrons occupying the outermost shell of an atom and the electrons occupying in the energy band are called  
 a) Energy band                  b) Valence band  
 c) Forbidden energy band      d) None of these
74. Conductors are those materials in which the free electrons  
 a) Very large                  b) Very small  
 c) Plenty of                    d) None of these
75. Doping is the process in which the small amount of impurity is added into the pure semiconductor lattice in the ratio  
 a) 1 to  $10^3$                       b) 1 to  $10^4$   
 c) 1 to  $10^5$                       d) 1 to  $10^6$
76. The technological uses of super conductors are  
 a) MRI  
 b) Magnetic levitation trains  
 c) Faster computer chips  
 d) All of them
77. The magnetism produced by electrons within an atom is due to  
 a) Spin motion                  b) Orbital motion  
 c) Spin & orbital motion      d) None of these
78. The combination of solenoid and a specimen of iron inside it make a powerful magnet called  
 a) Horse shoe magnet      b) Bar magnet  
 c) Electromagnet              d)  $10^{-10}$  to  $10^{18}$
79. In the phenomenon of hysteresis, the magnetism and magnetizing current behaves as  
 a) 1 lags                              b) 1 leads B  
 c) 1 & B becomes equal          d) None of these
80. A current which demagnetize the material completely is called  
 a) Applied current              b) Coercive current  
 c) Maximum current            d) None of these
81. The energy need to magnetize and demagnetize the specimen during the each cycle of magnetizing current is  
 a) Value of current  
 b) Value of demagnetizing current  
 c) Value of magnetic flux density  
 d) Area of the loop
82. The strain energy density is given by  
 a)  $U = \frac{1}{2} (Stress \times Strain)$   
 b)  $U = \frac{1}{3} (Stress \times Strain)$   
 c)  $U = \sqrt{Stress \times Strain}$   
 d)  $U = (Stress \times Strain)^{\frac{1}{3}}$
83. When the conductivity of a semiconductor is only due to breaking of the covalent bonds, the semiconductor is called  
 a) Donor                              b) Acceptor  
 c) Intrinsic                          d) Extrinsic
84. What is the S.I unit of magnetic permeability?

- a) Ampere per meter
- b) Ampere meter
- c) Henry per meter
- d) Being a dimensionless number, it has no unit

- input AC
- d) Either positive or negative half cycle of input AC
- 3. A bridge rectifier is preferable to an ordinary two diodes full wave rectifies because
  - a) It uses four diodes
  - b) Its transforms has no counter tap
  - c) It needs much smaller transformer
  - d) It has higher safety factor
- 4. The color of light emitted by LED depends on
  - a) Its forward biased
  - b) Its reversed biased
  - c) The amount of forward current
  - d) The type of semi conductor material used
- 5. A PN junction photodiode is
  - a) Operated in forward direction
  - b) Operated in reversed direction
  - c) A very fast photo detector
  - d) Dependent on thermally generated minority carriers
- 6. The emitter of a transistor is generally doped the heaviest because it
  - a) Has to dissipate maximum power
  - b) To supply the charge carriers
  - c) Is the first region of transistor
  - d) Must posses low resistance



## CHAPTER # 18 ELECTRONICS

1. A semi – conductor can be used as a rectifier because
  - a) It has low resistance to the current flow when forward biased
  - b) It has high resistance to the current flow when reversed biased
  - c) It has low resistance to the current flow when forward biased and high resistance when reversed biased
  - d) None of the above
2. In half wave rectification, the output DC voltage is obtained across the load for
  - a) The positive half cycle of input AC
  - b) The negative half cycle of input AC
  - c) The positive and negative half cycles of

7. For proper working of a transistor in normal circuits
  - a) Emitter base junction is reversed biased, collector base junction is forward biased
  - b) Emitter base junction is forward biased and collector base junction is forward biased
  - c) C-B junction is reversed biased, E-B junction is forward biased
  - d) C-B junction is reversed biased and E-B junction is reversed biased
8. In a properly biased NPN transistor most of the electrons from the emitter
  - a) Recombine with holes in the base
  - b) Recombine in the emitter itself
  - c) Pass through the base to the collector
  - d) Are stopped by the junction barrio
9. The current gain of a transistor is given by



a.  $\frac{I_C}{I_E}$

b.  $\frac{I_C}{I_B}$

c.  $\frac{I_B}{I_E}$

d.  $\frac{I_B}{I_E}$

10. When the E-B junction of a transistor is reversed – biased, collector current

- a) Is reversed                      b) Increased  
c) Decreased                      d) Stops

11. An op-AMP has

- a) Infinite AV                      b) Infinite Ri  
c) Zero Ro                      d) All the above

12. An inverting amplifier has  $R_f = 2\text{m}\Omega$  and  $R_i = 2\text{K}\Omega$ , its scalar factor is

- a) 1000                      b) -1000  
c)  $10^{-13}$                       d)  $-10^{-6}$

13. A diode characteristic curve is a graph between

- a) Current and time  
b) Voltage and time  
c) Voltage and current  
d) Forward voltage and reverse current

14. A NOR Gate is ON only when all its input are

- a) ON                      b) OFF  
c) Positive                      d) High

15. A logic gate is an electronic circuit which

- a. Makes logic decision  
b. Work on binary algebra  
c. Alternates between 0 and 1  
d. None of these

16. In positive logic, logic state 1 correspond to

- a) Positive voltage  
b) Higher voltage level  
c) Zero voltage level  
d) Lower voltage level

17. The output of a 2-input OR gate is zero only when its

- a. Both input are zero  
b. Either input is 1  
c. Both input are 1  
d. Either input is 0

18. An XOR gate produces an output only when its two inputs are

- a) High                      b) Low  
c) Different                      d) Same

19. An AND Gate

- a. Implement logic addition  
b. Is equivalent to a series switching circuit  
c. Is any or all gate  
d. Is equivalent to a parallel switching circuit

20. The only function of a NOT gate is to

- a. Stop a signal  
b. Re-complement a signal  
c. Invert an input signal  
d. Acts as a universal gate

21. A NOR gate is ON only when all its input are

- a) ON                      b) OFF  
c) Positive                      d) High

22. Which of the following are electromagnetic waves

- a. Sound waves  
b. Water waves  
c. Light waves  
d. Waves along a stretched string

23. The EM waves travel in free space with the velocity

- a. Equal to the velocity of sound  
b. Equal to the velocity of light  
c. More than the velocity of light  
d. Less than the velocity of light

24. A changing electric flux develops in the surrounding space

- a. An electric field  
b. A magnetic field  
c. An electromotive force  
d. Gravitational field

25. EM waves transport

- a) Matter                      b) Wavelength  
c) Energy                      d) Charge



26. Waves emitted from the antenna are

- a. Longitudinal waves
- b. EM waves
- c. Sound waves
- d. Radio waves

27. EM waves emitted from antenna are

- a. Stationary
- b. Longitudinal
- c. Transverse
- d. All of the above

28. The waves from the antenna are

- a. Expanding plane wave fronts
- b. Concentric spheres
- c. Expanding curves
- d. None of the above

29. EM waves have frequency of the range of

- a.  $10^4\text{Hz}$
- b.  $10^5\text{Hz}$
- c.  $10^6\text{Hz}$
- d.  $10^{12}\text{Hz}$

30. Maxwell derived mathematically that velocity of EM-waves is

- a.  $\frac{I}{\sqrt{\Sigma_o}}$
- b.  $\frac{I}{\sqrt{u}}$
- c.  $\frac{\Sigma_o}{\sqrt{u_o}}$
- d.  $\frac{I}{\sqrt{\Sigma_o u_o}}$

A gateway for knowledge Seekers



- a) Bismuth
  - b) Arsenic
  - c) Antimony
  - d) Silicon-dioxide
35. Specially designed semi conductor diodes used as fast counters in electronic circuits are
- a. Photo diodes
  - b. LED
  - c. Solar cell
  - d. Photo voltaic cell
36. The specially designed semi conductor diodes used as indicator lamp in electronic circuit are
- a) Photo diodes
  - b) Solar cell
  - c) LED
  - d) Photo voltaic cell
37. The term transistor stands for
- a. Transfer of current
  - b. Transfer of voltage
  - c. Transfer of resistance
  - d. Transfer of charge
38. The thickness of depletion region is of the order of
- a)  $10^{-7}\text{ cm}$
  - b)  $10^{-6}\text{ cm}$
  - c)  $10^{-5}\text{ cm}$
  - d)  $10^{-4}\text{ cm}$
39. In amplitude modulation, the wave superimposed on EM waves are
- a) Water waves
  - b) Sound waves
  - c) Light waves
  - d) Matter waves
40. A junction diode when forward biased behaves as a device of
- a. Zero resistance
  - b. Infinite resistance
  - c. Low resistance
  - d. High resistance
41. The P.d across the depletion region of silicon is
- a. 0.5v
  - b. 0.67v
  - c. 0.7v
  - d. 0.8v
42. A Transformer used in rectification acts as
- a. Step-up
  - b. Step-down
  - c. Center trapped
  - d. None
43. The ratio of  $\beta$  shows the
- a. voltage gain
  - b. current gain

- c. input resistance      d. None
44. The alarm requires a voltage for its activation is
- a. low      b. high  
c. Very High      d. None
45. What is the gain of op – amplifier if  $R_1 = \infty$  and  $R_2 = 0\Omega$
- a. 15      b. 1000  
c. 1      d. Cannot tell
46. The resistance between + ive and – ive inputs of op – amplifier is
- a.  $100\Omega$       b.  $1000\Omega$   
c.  $10^6\Omega$       d. None of these
47. Photo – voltaic cell have
- a. Battery input      b. No external bias  
c. No internal bias      d. None
49. In NOR gate  $1 + 1 =$  \_\_\_\_\_
- a. 0      b. 2  
c. 1      d. 3
50. Transistor can be used as
- a. Oscillators      b. Switches  
c. Memory unit      d. All of them
51. NOT gate has only
- a. One input      b. Two inputs  
c. Many inputs      d. None
52. The efficiency of half wave rectifier is roughly
- a. 40%      b. 60%  
c. 70%      d. 90%
53. A photo – diode can switch its current ON and OFF in
- a. Milli seconds      b. Micro seconds  
c. Nano seconds      d. None
54. A transistor is a circuit basically act as
- a. Voltage amplifier      b. Current amplifier  
c. Power amplifier      d. None
55. Transistor is a device which has \_\_\_\_\_ terminals.
- a. One      b. Two  
c. Three      d. Four
56. The Boolean expression  $X = A + B$  represents the logic operation of
- a. NAND gate      b. NOR gate  
c. OR gate      d. NOT gate
57. A diode can not be used as
- a. Rectifier      b. Detector  
c. Oscillator      d. Amplifier
58. XOR gate is combination of
- a. AND, OR and NOT gate  
b. NAND, OR and NOT gate  
c. NOT, AND and OR gate  
d. NOT, AND and NOR gate
59. The open loop gain of op – amplifier is
- a. Zero      b. High  
c. Very high      d. Low
60. The width of depletion region of a diode
- a. Increases under forward bias  
b. Is independent of applied voltage  
c. Increases under reverse bias  
d. None of these
- LED emits lights only
- a. Forward biased      b. Reverse Biased  
c. Un biased      d. None of these
62. In a pn junction, the barrier potential offers opposition to only
- a) Majority carriers in both regions  
b) Minority carriers in both regions  
c) Electrons in n – region  
d) Holes in P – region
63. In the use of a transistor as an amplifier
- a) The emitter-base junction is forward biased and the collector-base junction is reverse biased  
b) The emitter-base junction is reverse biased and the collector-base junction is forward biased  
c) Both the junctions are forward biased  
d) Any of the two junctions may be forward biased
64. NAND gate is a combination



- a) AND gate and NOT gate  
b) AND gate and OR gate  
c) OR gate and NOT gate  
d) NOT gate and NOT gate
65. The reverse or leakage current of the diode is of the order of
- a) Microampere                      b) Milli-ampere  
c) Both                                  d) None of these
66. How many diodes are used for the full wave rectification is
- a) Two                                  b) Three  
c) Four                                  d) None of these
67. A photodiode can turn its current ON and OFF in
- a) Microsecond                      b) Millisecond  
c) Nanosecond                      d) None of these
68. The base of the transistor is very thin of the order of
- a)  $10^{-2}$ m                                  b)  $10^{-4}$ m  
c)  $10^{-6}$ m                                  d)  $10^{-8}$ m
69. The gain A of the amplifier is
- a)  $A = \frac{\Delta V_{in}}{\Delta V_o}$                                   b)  $A = \frac{\Delta V_i}{\Delta V_o}$   
c)  $A = \Delta V_o \Delta V_{in}$                                   d) None of these
70. The positive sign of the gain indicates that
- a) Input and output signals are not in phase  
b) Input and output signals are in phase  
c) May be in phase or not  
d) None of these
71. The electronic circuits which implement the various logic operations are known as
- a) Digital gates                      b) Logic gate  
c) Voltage operated gate                      d) All of them
72. A diode characteristic curve is a plot between
- a) Current and time  
b) Voltage and time  
c) Voltage and current  
d) Forward voltage and reverse voltage
73. In a half-wave rectifier the diode conducts during

- a) Both halves of the input cycle  
b) A portion of the positive half of the input cycle  
c) A portion of the negative half of the input cycle  
d) One half of the input cycle

74. The output of a two inputs OR gate is 0 only when its
- a) Both inputs are 0                      b) Either input is 1  
c) Both inputs are 1                      d) Either input is zero
75. For typical transistor as an amplifier
- a)  $\frac{V_{out}}{V_{in}} = \beta \frac{R_c}{R_{ie}}$                       b)  $\frac{V_{out}}{V_{in}} = \beta$   
c)  $\frac{V_{out}}{V_{in}} = \beta \frac{R_{ic}}{R_c}$                       d)  $\frac{V_{out}}{V_{in}} = \beta \frac{R_{ie}}{R_{ic}}$
76. The resistance between (+) and (-) of ideal Op-Amp is
- a) High                                  b) Low  
c) Infinity                                  d) Moderate
77. Temperature, pressure etc are converted into electronic informations by devices called
- a) Vacuum tubes                      b) Sensors  
c) Sensors                                  d) None

## CHAPTER 19 DAWN OF MODERN PHYSICS

1. An observer shoots parallel to a meter stick at very high speed (relativistic) and finds that the length of meter stick is \_\_\_\_\_
- a) Greater than one meter  
b) Less than one meter  
c) One meter  
d) None of these
2. 0.001 Kg mass will be equivalent to
- a) 2.5 GWh                                  b) 25 GWh  
c) 0.26 GWh                                  d) 250 GWh
3. Which of the following radiations has the greatest photon

- a) TV waves      b) Microwaves  
c) X-rays        d)  $\gamma$  - rays
4. Linear momentum of a photon is
- a) Zero              b)  $hf/c^2$   
c)  $hf/c$             d)  $c^2/hf$
5. The linear momentum of an x-ray photon of wavelength  $0.1\text{\AA}$  is
- a)  $6.625 \times 10^{-23}$  NS  
b)  $66.25 \times 10^{-23}$  NS  
c)  $662.5 \times 10^{-23}$  NS  
d) Data is insufficient
6. Stopping potential for a metal surface incase of photo electric emission depends on
- a) The threshold frequency for the metal surface  
b) The intensity of incident light  
c) The frequency of incident light and the work function for metal surface  
d) None of these
7. Select an alternative form of uncertainty principle from the following
- a.  $h/mc\lambda$                       b.  $\Delta E \Delta t$   
c.  $mc^2 = hf$                   d. Any of the above
8. The existence of ether wind was experimentally rejected by
- a) HeisenbergEinstein      b) Michelson and Morely  
d) De-Broglie                d) None
9. As the temperature of black body is raised, the wavelength corresponding to maximum intensity
- a) Shifts towards longer wavelength  
b) Shifts towards shorter wavelength  
c) Remains the same  
d) Shifts towards shorter as well as longer wavelength
10. Rest mass of photon is
- a) Infinite                      b) Zero  
c) Very small                d) Very large
11. The name of photon for quantum of light was proposed by
- a) Ampere                      b) Planck's  
c) Thomson                  d) Einstein

12. A photon is a \_\_\_\_\_
- a. Unit of energy  
b. Positively charged particle  
c. Quantum of electromagnetic radiations  
d. Unit of wavelength
13. Which one of the following has the largest energy content?
- a.  $10^3$  photons of wavelength  $2\text{pm}$  (Y-rays)  
b.  $10^2$  photons of wavelength  $1\text{mm}$  (X-rays)  
c.  $10^6$  photons of wavelength  $50\text{mm}$  (Infrared)  
d.  $10^6$  photons of wavelength  $200\text{mm}$  (UV)
14. A transmitting station emits radio waves of wavelength  $\lambda$  at power  $p$ . if  $h$  is plank's constant  $C$  the speed of light, what is the rate of emission of photon?
- a)  $pc/h\lambda$                       b)  $hc/p\lambda$   
c)  $p\lambda/hc$                       d)  $ph/ck$
15. After traveling through a vacuum, a photon of light entering into some transparent denser medium. Thus the energy of light \_\_\_\_\_.
- a. Increase because wave light decrease  
b. Decrease because speed decrease  
c. Remains same  
d. Increase then decrease
16. In a photo electronic effect, monochromatic light, is incident on a metal surface. If the incident light of twice the intensity but the same wave length, the kinetic energy of the emitted electron \_\_\_\_\_
- a) Becomes double  
b) Remains same  
c) Becomes half  
d) First increase then decreases because curvilinear graph.
17. If the wave length of incident radiation is increase in photo emission, then \_\_\_\_\_
- a) The minimum kinetic energy of the photo electrons increase  
b) The minimum kinetic energy of the photoelectrons decrease  
c) The minimum kinetic energy of the photoelectrons increase

- d) The average kinetic of the photoelectrons decrease
18. If a photon is reflected from the mirror, then the change in momentum of each photon is \_\_\_\_\_
- a) Zero                      b)  $2\frac{h}{\lambda}$
- c)  $\frac{h}{\lambda}$                       d)  $Ft$
19. If n number of photon are striking on a metal surface, then the total momentum exerted is \_\_\_\_\_
- a.  $\frac{nh}{\lambda}$                       b.  $\frac{2nh}{\lambda}$
- c. Zero                      d.  $nft$
20. A photon of wave length 900nm behaves like a particle of mass \_\_\_\_\_
- a.  $5.53 \times 10^{-36}$  kg
- b. 0 Kg
- c.  $2.46 \times 10^{-36}$  kg
- d.  $1.84 \times 10^{-44}$  kg
21. The velocity of particle of mass m of de-Broglie wave length  $\lambda$  is \_\_\_\_\_
- a.  $\frac{2h}{m\lambda}$                       b.  $\frac{mSc^2}{h}$
- c.  $\frac{2m\lambda c^2}{h}$                       d.  $\frac{h}{m\lambda}$
22. In Davison – Germer experiment, the diffracted proton from crystal shows \_\_\_\_\_
- a) Particle property                      b) Wave property
- c) Light property                      d) Quantum property
23. If a diffracted grating is placed in the path of a light beam, it reveals \_\_\_\_\_
- a. Wave property
- b. Particle property
- c. Energy particle
- d. Electromagnetic wave property
24. In electron microscope, electric and magnetic field are used as \_\_\_\_\_
- a. Electromagnetic gun
- b. Source of electromagnetic waves
- c. Deflected charged particle
- d. Converging source of electrons
25. A three dimensional image is obtained by \_\_\_\_\_
- a. Electron microscope
- b. Scanning electron microscope
- c. Magnetic imaging
- d. None of the above
26. The uncertainty in momentum and position is due to its \_\_\_\_\_
- a. Property of matter and radiation
- b. Two dimensional motions
- c. Emotion of certain wave length
- d. Very high velocity
27. For confinement of electron in a box of radius  $10^{-14}$  m. the electron speed should be \_\_\_\_\_
- a.  $10^7$  m/sec
- b. Should be greater than speed of light
- c. Be zero
- d. Not be wave link
28. The energy radiated is directly proportional to fourth power of Kelvin's temperature is \_\_\_\_\_
- a. Karl-wein's laws
- b. Raleigh jeans law
- c. Stephens law
- d. Planck's
29. Compton effect proves the \_\_\_\_\_
- a. Photon theory of light
- b. Deal nature of light
- c. Wave nature of light
- d. Uncertain nature of light
30. Electron moves in the orbit as \_\_\_\_\_
- a. Simple vibratory motion
- b. Standing wave motion
- c. Vibratory motion like up and down
- d. S.H.M like sound
31. The mass of an object will be doubled at speed \_\_\_\_\_
- a.  $1.6 \times 10^8$  m/sec                      b.  $2.6 \times 10^8$  m/sec
- c.  $2.6 \times 10^7$  m/sec                      d. None
32. The anti-particle of electron is \_\_\_\_\_

- a. Proton  
c. Meson
- b. Position  
d. Neutron
33. The reverse process of pair-production is
- a. Annihilation  
c. Fission
- b. Materialization  
d. Fussion
34. The decrease in length with speed was explained by
- a. Einstein  
c. Bohr
- b. Lorentz  
d. None
35. The famous Michel-son-Morely experiment proves that
- a. Light is energy  
b. Earth rotates about its axis  
c. Ether medium does not exist  
d. None
36. All the motion in this universe are
- a. Absolute  
c. Variable
- b. Uniform  
d. Relative
37. On a hot day white clothes are cold than dark clothes are
- a. Reflective  
c. Radiators
- b. Absorbent  
d. None
38. The radiation emitted by human body lies in the range of
- a. Infrared region  
c. Visible region
- b. U.V region  
d. None
39. The energy emitted is directly proportional to fourth power of temperature is
- a. Lummer Law  
c. Wein's Law
- b. Stephen – Boltzman Law  
d. None
40. Wein's displacement law holds good for
- a. Short wavelength  
c. All wavelength
- b. Large wavelength  
d. None
41. Plank's theory is hold good for
- a. Short wavelength  
c. All wavelength
- b. Large wavelength  
d. None
42. According to special theory of relatively the 4<sup>th</sup> variable is
- a. Time  
c. Speed of light
- b. Space  
d. None
43. Pair production cannot possible in
- a. Air  
c. Glass
- b. Water  
d. Vacuum
44. The wavelength of photon with energy of  $16 \times 10^{-19}$  J is
- a.  $12.4^\circ \text{A}$   
c.  $124^\circ \text{A}$
- b.  $1.24^\circ \text{A}$   
d. None
45. The concept of antimatter was predicted theoretically by Dirac in
- a. 1928  
c. 1935
- b. 1930  
d. None
46. The anti-particle of earth is
- a. Sun  
c. Black hole
- b. Moon  
d. None
47. The minimum energy required for pair production
- a. 10.2 Mev  
c. 102 Mev
- b. 1.02 Mev  
d. None
48. Photo electric effect for visible light can be obtain from
- a. Sodium – Potassium  
c. Helium – Neon
- b. Carbon – oxygen  
d. None
49. Sound tracks of movies can be controlled by
- a. Diode  
c. Amplifier
- b. Rectifier  
d. Photo – cell
50. The relation  $\lambda_{\text{Max}} T = \text{Contt.}$  is
- a. Wein's Law  
c. Stephen Law
- b. Plank's Law  
d. None
51. A. H Compton was awarded Nobel Prize in Physics in
- a. 1927  
b. 1923

- c. 1921 d. 1919
52. The life time of an electron in an excited state is  $10^{-6}$  sec. What is uncertainty in energy for this time?
- a.  $2.35 \times 10^{-20}$  J b.  $1.09 \times 10^{-20}$  J  
c.  $1.05 \times 10^{-26}$  J d. None
53. The photograph taken by electro-microscope is called
- a. Photograph b. Electron micrograph  
c. Chronograph d. None
54. At stopping potential current passing through circuit is
- a. Mini b. Very low  
c. Zero d. None
55. The value of Wein's Constant is
- a.  $2.9 \times 10^{-3}$  mol .k b.  $1.38 \times 10^{-3}$  m.k  
c.  $3.51 \times 10^{-3}$  m.k d. None
56. The reverse process of Photo-electric effect is
- a. Compont Effect b. Pair-product  
c. Annihilation d. None
57. If work function is 4.14ev, the threshold frequency of incident light is
- a.  $10^{12}$  Hz b.  $10^{13}$  Hz  
c.  $10^{14}$  Hz d.  $10^{15}$  Hz
58. Each quantum is associated with radiation of
- a. Intensity b. Energy  
c. Frequency d. None
59. Loius Broglie give the idea of Matter – wave in
- a. 1924 b. 1925  
c. 1926 d. 1928
60. A passenger passes a clock with a speed  $\frac{C}{2}$ .  
The time period observed by him is:
- a)  $t = t_0$  b)  $\frac{\sqrt{3}}{2} t_0$   
c)  $t = \sqrt{\frac{2}{3}} t_0$  d)  $t = \frac{2}{\sqrt{5}} t_0$

61. The threshold frequency of metals is  $2 \times 10^{-4}$  Hz. The work function of metal is
- a)  $13.26 \times 10^{-38}$  ev b)  $13.26 \times 10^{-38}$  J  
c) 13.26 ev d) None
62. The wavelength associated with electron moving with speed  $5.6 \times 10^6$  m/s is
- a) 12nm b) 0.12nm  
c) 1.2nm d) 120nm
63. The uncertainty in position of electron is  $6.63\text{\AA}$ . The uncertainty in momentum of electron is
- a)  $10^{-24}$  N-S b)  $10^{-48}$  N-S  
c)  $10^{-16}$  N-S d)  $10^{-20}$  N-S
64. The concept of position is purely
- a) Specific b) Relative  
c) Ordinary d) None of these
65. A quantity  $\sqrt{1 - \frac{v^2}{c^2}}$  is always
- a) Greater than one b) Less than one  
c) Equal to one d) None of these
66. At higher temperature, the body emits long wavelength in the region
- a) Infra red b) Ultraviolet  
c) Far-infra red d) None of these
67. The Stefen-Boltzmann has the value
- a)  $5.67 \times 10^{-5} \text{Wm}^{-2} \text{K}^{-4}$   
b)  $5.67 \times 10^{-6} \text{Wm}^{-1} \text{K}^{-4}$   
c)  $5.67 \times 10^{-6} \text{Wm}^{-2} \text{K}^{-4}$   
d)  $5.67 \times 10^{-8} \text{Wm}^{-2} \text{K}^{-4}$
68. The energy of photon of radio waves is only about
- a)  $10^{-6}$  eV b)  $10^{-4}$  eV  
c)  $10^{-10}$  eV d)  $10^{-12}$  eV
69. The stopping potential when intensity is kept constant is
- a) Same b) Different  
c) Both a & b d) None of these



70. The idea of quantization of energy was proposed by
- a) Einstein                      b) Max Planck  
c) Compton                      d) None of these
71. Application of photoelectric effect is
- a) Photo diode                      b) Photo transistor  
c) Photocell                      d) None of these
72. In Compton effect, the law/laws are conserved
- a) Energy                      b) Momentum  
c) Both                      d) None of these
73. The equations of pair production is
- a)  $hf = 2m_0c^2 - KE(e^-) + K.E(e^+)$   
b)  $hf = 2m_0c^2 + KE(e^-) + K.E(e^+)$   
c)  $hf = 2m_0^2c^2 + KE(e^-) + K.E(e^+)$   
d)  $hf = 2m_0^2c + KE(e^-) + K.E(e^+)$
74. Louis De Broglie received Nobel prize in physics in
- a) 1926                      b) 1922  
c) 1925                      d) 1929
75. The high energy electrons penetrate the specimen to reasonable thickness and require sufficient energy due to its
- a) Short wavelength  
b) Extremely short wavelength  
c) Long wavelength  
d) None of these
76. The best optical resolution is made by the microscope is
- a)  $0.1 \mu m$                       b)  $0.2 \mu m$   
c)  $0.3 \mu m$                       d) None of these
77. In Compton effect  $\lambda$  is always
- a) Less than  $\lambda$                       b) Greater than  $\lambda$   
c) Equal to  $\lambda$                       d) None of these
78. Who discovered the idea of Ether?
- a) Schrodinger                      b) De-Broglie  
c) Michelson and Morley                      d) None of these
79. Can pair production takes place in vacuum because of conservation of

- a) Energy                      b) Momentum  
c) Momentum & Energy                      d) None of these
80. Which of the following has the same dimension as  $h/m_0c$ ?
- a) Length                      b) Time  
c) Mass                      d) None
81. Photon 'A' has twice the energy of photon 'B'. What is the ratio of the momentum of 'A' to that of 'B'?
- a) 4 : 1                      b) 2 : 1  
c) 1 : 2                      d) None
82. An electron accelerated through a P.D, V has a wave associated with it of wavelength
- a)  $12.3\sqrt{V} A^\circ$                       b)  $12.3 / VA^\circ$   
c)  $12.3 / V^2 A^\circ$                       d) None



## CHAPTER # 20 ATOMIC SPECTRA

1. Ratio of the weight of H-atom to that of an electron is approximately \_\_\_\_\_
- a. 183.336                      b. 1836  
c. 18360.00                      d. 183.60
2. Photon of high frequency will be absorbed when transisation takes place from \_\_\_\_\_
- a.  $1^{st}$  to  $5^{th}$  orbit                      b.  $2^{nd}$  to  $5^{th}$  orbit  
c.  $3^{rd}$  to  $5^{th}$  orbit                      d.  $4^{th}$  to  $5^{th}$  orbit
3. In Hydrogen spectrum, which one of the following series lies in the ultraviolet region?



- a. Ballmer series      b. Pfund series  
c. Lyman series      d. Bracket series

4. In obtaining an x-ray photograph of our hand, we use the principle of \_\_\_\_\_

Photo electric effect  
Ionization  
Shadow photograph  
Any of above

5. Excited atoms return to their ground state in \_\_\_\_\_

- a)  $10^{-10}$ S      b)  $10^{-8}$ S  
c)  $10^{-6}$ S      d)  $10^{-9}$ S

6. When we excite some atoms by heat collision or electrical discharge, they will \_\_\_\_\_

- a. radiate electromagnetic energy with a continuous distribution of wavelength  
b. Absorb particular wavelengths when white light is incident on them  
c. Radiate electromagnetic energy of discrete characteristic wavelength  
d. Emit either invisible or visible light

7. Hydrogen atom does not emit x-rays because \_\_\_\_\_

- a. Its energy level are too close to each other  
b. Its energy level are too far apart  
c. It is too small in size  
d. It has a single electron

8. Which one of following postulate is in accordance with the Rutherford's model?

- a. Continuous spectra for atoms  
b. Discrete spectra for atoms  
c. Either continuous for atoms  
d. No spectrum

9. X-rays are \_\_\_\_\_

- a. Unknown nature  
b. High energy electrons  
c. High energy photon  
d. Radioisotopes

10. Ground state energy of the 4<sup>th</sup> orbit in a H-atom is \_\_\_\_\_

- a. 13.60eV      b. 3.40eV

- c. 0.85eV      d. -1.51eV

11. Total number of series in hydrogen spectrum is \_\_\_\_\_

- a. Three      b. Four  
c. Five      d. Six

12. The radiations emitted from hydrogen filled discharge tube show \_\_\_\_\_

- a. Bound spectrum      b. Line spectrum  
c. Continuous spectrum      d. Absorption spectrum

13. The electric P.E of an electron in an orbit at a distance from the positive charge \_\_\_\_\_

- a.  $Ke^2/rn$       b.  $16e^2/rn^2$   
c.  $-ke^2/rn$       d.  $-ke^2/rn^2$

14. Radiation with wavelength longer than red light \_\_\_\_\_

- a. Ultraviolet rays      b. X-rays  
c. Infrared radiation      d. Visible radiations

15. Bracket series is obtained when all transition of electron terminate on \_\_\_\_\_

- a. 5<sup>th</sup> orbit  
b. 2<sup>nd</sup> orbit

16. In an electronic transition, atom cannot emit \_\_\_\_\_

- a.  $\gamma$  - rays      b. Infrared radiation  
c. Visible light      d. Ultraviolet rays

17. Reverse process of photo electric effect is \_\_\_\_\_

- a. Pair production      b. Compton effect  
c. Annihilation of matter      d. X-rays production

18. X - rays are similar in nature to \_\_\_\_\_

- a. Cathode rays      b. Positive rays  
c.  $\gamma$  - rays      d.  $\alpha$  - rays

19. The penetrating power of X-ray depends on their \_\_\_\_\_

- a. Applied voltage      b. Frequency  
c. Source      d. All of the above

20. When X-rays are passed through successive aluminum sheets, what

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- a. It increases  
b. It decreases  
c. Remains same  
d. Sometimes increase sometimes decreases
21. The penetrating power of X-rays is comparable with that of \_\_\_\_\_  
a.  $\alpha$  - rays                      b.  $\beta$  - rays  
c.  $\gamma$  - rays                      d. All of above
22. Quality of X-rays depends upon \_\_\_\_\_  
a. Filament current  
b. Accelerating voltage  
c. Material of the target  
d. b and c
23. Radiation produced from T.V. picture tube is \_\_\_\_\_  
a.  $\gamma$  - rays                      b. X - rays  
c. Far infrared                      d. Infrared
24. In an X - ray tube, electrons each of charge  $e$  are accelerated through V potential difference allowed to hit metal target, the wavelength of the X-rays emitted is \_\_\_\_\_  
a.  $hc/ev$                       b.  $he/vc$   
c.  $ev/h$                       d. impossible to predict
25. The minimum wavelength of X-rays can further be reduced by \_\_\_\_\_  
a. Reducing the pressure of cooling the target  
b. Increasing the temperature of the filament  
c. Using a target element of higher atomic number  
d. Increasing the potential difference b/w the cathode and the target
26. The characteristic X-rays spectrum is due to \_\_\_\_\_  
a. The illumination of the target metal by ultraviolet radiation  
b. The bombardment of the target by proton  
c. The bombardment of target by electron  
d. The absorption of Y-radiation by the target metal

27. The minimum wavelength of X-rays produced by the bombardment of electron on the screen of a T.V. set where the accelerating potential is 2.0 K,V will be \_\_\_\_\_  
a.  $6.2 \times 10^{-10} \text{ m}$                       b.  $9.1 \times 10^{-18} \text{ m}$   
c.  $3.11 \times 10^{-10} \text{ m}$                       d.  $4 \times 10^{-10} \text{ m}$
28. Maximum frequency in the spectrum from x-rays tube is directly proportional to the \_\_\_\_\_  
a. Number of electron i.e. filament current  
b. The kinetic energy of incident electron  
c. The soft target which can easily emit electron  
d. All the above are correct
29. X-rays are diffracted by a crystal but not by a diffraction grating because \_\_\_\_\_  
a. The ions in a crystal are well arranged  
b. The lines in a diffraction grating cannot reflect X-rays  
c. The penetrating power of x-rays is which in a diffraction grating  
d. The wavelengths of x-rays are of same order of magnitude as the separation between atoms in a crystal
30. \_\_\_\_\_ radiation can be produced by  
a. Heating the filament  
b. Ionization of atoms  
c. Electron excitation in the gas  
d. All the above
31. What is the velocity of a particle of mass  $m$  and de-Broglie Wavelength?  
a.  $h/m\lambda$                       b.  $2h/m\lambda$   
c.  $Mh/h$                       d.  $(2hc/m\lambda)^{1/2}$
32. Wave like characteristic of electron is demonstrated by \_\_\_\_\_  
a. Line spectrum of atoms  
b. Production of X-rays  
c. Diffraction by crystalline solids  
d. Photo electric effect
33. Electron cannot exist in the nucleus, it is confirmed by observing that \_\_\_\_\_  
a. At does emit Y-radiation  
b. Its size as compare to proton and neutron is

- very small  
c. No antiparticle of electron is present  
d. The velocity of electron must be very high according to uncertainty principle

34. In normal state of energy, the incident high energy photons will be \_\_\_\_\_

- a. Stimulated  
b. Absorbed  
c. Cause X-rays emission  
d. Cause laser production

35. In laser production, the state in which more atoms are in the upper state than in the lower one is called \_\_\_\_\_

- a. Metal stable state      b. Normal state  
c. Inverted population      d. All the above

36. The meta stable state for an atom in laser light is \_\_\_\_\_

- a.  $10^{-4}$  sec      b.  $10^{-5}$  sec  
c.  $10^{-3}$  sec      d.  $10^{-8}$  sec

37. In He – Ne laser, the lasing action is produced by \_\_\_\_\_

- a. Ne only      b. He – Ne both  
c. Electrons of He      d. Electrons of Ne

38. Reflecting mirrors in laser is used to \_\_\_\_\_

- a. Further stimulation  
b. Lasing more  
c. For production more energetic laser  
d. All the above

39. The velocity of laser light is \_\_\_\_\_

- a. Less than ordinary light  
b. More than ordinary light  
c. Equal to ordinary light  
d. Different for different colors or frequency

40. Laser beam can be used to generate

- a. One dimensional images  
b. Two dimensional images  
c. Three dimensional images  
d. None of these

41. X – rays is also known as

- a. photon      b.  $\gamma$  – rays  
c. bremsstrahlung      d. none

42. Bremsstrahlung is a phenomenon in which the rate of slowing down of electron is

- a. small      b. large  
c. very large      d. None

43. The value of Rydberg's constant is

- a.  $1.0974 \times 10^7 \text{ m}^{-1}$       b.  $1.0794 \times 10^7 \text{ m}^{-1}$   
c.  $1.0974 \times 10^{-7} \text{ m}^{-1}$       d. None

44. The shortest wavelength radiation in Brackett series has wavelength

- a.  $\frac{16}{R_H}$       b.  $\frac{R_H}{16}$   
c.  $16 R_H$       d. None

45. Bohr's theory is failed to explain

- a. H – spectrum      b. He – spectrum  
c. Complex atoms spectrum      d. None

46. The ionization energy of H – atom is

- a. – 13.6 eV      b. 13.6 eV  
c.  $\pm 13.6$  eV      d. none

47. Which one of the following is more coherent

- a. X – rays      b. Normal light  
c.  $\gamma$  – rays      d.  $\gamma$  – rays

48. Sunlight spectrum is

- a. Discrete      b. Line spectrum  
c. Continuous spectrum      d. none

49. Optical pumping exists in

- a. X – rays      b. Laser  
c. Spectrum      d. None

50. A common He – Ne gas laser contains, He – Ne ratio

- a. 85 – 15 %      b. 80 – 20 %  
c. 70 – 30 %      d. None

51. The total energy of electron in an orbit around the nucleus is

- a. +ve      b. –ve  
c. zero      d. None

52. According to Bohr's theory the outer orbit electron has \_\_\_\_\_ energy than inner

- orbits.
- Greater
  - Smaller
  - Equal
  - None of these
53. The name of electron was suggested by
- Rutherford
  - Chadwick
  - Thomson
  - Stony
54. X – rays was discovered by
- Bacquerel
  - Mari – curie
  - Roentgen
  - Lane
55. The idea of laser was first introduced in 1958 by
- Frank – white
  - C.H.Towner
  - Dr. Gilbert Young
  - C.H.Towner
56. The ratio of volume of an atom to the volume of nucleus is
- $10^3$
  - $10^6$
  - $10^9$
  - $10^{12}$
57. The value of Plank's constant is
- $6.63 \times 10^{-34}$  J.sec
  - $6.63 \times 10^{-34}$  J/sec
  - $6.63 \times 10^{-34}$  sec/J
  - None
58. Laser is a device which can produce
- an intense beam of light
  - Coherent light
  - Monochromatic light
  - All
59. The total energy of electron in state  $n = \alpha$  is
- + ive
  - ive
  - zero
  - None
60. When magnetic field is applied in the path X – rays , they will be moving in
- Straight line
  - Circular path
  - Parabolic path
  - None
61. With the help of laser beam we can produce
- Fusion reaction
  - Holograms
  - Fragment of kidney stone
  - All of these

62. Continuous spectra is an example of
- Atomic
  - Molecular
  - Black body radiation
  - None of these
63. Line spectra is an example of
- Atomic
  - Molecular
  - Black body radiation
  - None of these
64. The quantized energy of first Bohr orbit of hydrogen atom is
- 13.04 eV
  - 13.6 eV
  - 13.6 eV
  - 13.5 eV
65. Bremsstrahlung are those in which radiations are produced of
- Long wavelength
  - Short wavelength
  - Wavelength in X-rays region
  - None of these
66. In LASER principle, a photon produce another photon by the process of
- Excitation
  - De-excite
  - Ionization
  - None of these
67. Characteristic X – rays are the X – rays which
- High energy photons
  - Specific wavelengths
  - Specific frequencies
  - All of these
68. X – rays can penetrate into a solid matter upto
- Few millimeter
  - Several millimeter
  - Few centimeter
  - Several centimeter
69. Computerized axial tomography (CAT-scanner) is a system in which X – rays are
- Maximum through the subject
  - Minimum absorptions through the subject
  - Depending upon the subject
  - None of these
70. X – rays can cause cancer in living cells due to radiation exposure which is
- Small
  - Large
  - Excessive
  - None of these

71. In Laser a Meta-stable state is
- An excite state
  - In which an electron is usually stable
  - In which an electron reside  $10^{-3}$  sec
  - None of these
72. The Meta-stable state of Helium and Neon is
- Different
  - Identical
  - Nearly identical
  - None of these
73. Laser beam can be used for
- Wilding of detached retinas
  - Destroy tissues in a localized area
  - Sealed off capillaries for prevention of disease
  - All of them
74. In Balmer series the shortest wavelength radiations have wavelength equal to

- $\left(\frac{R_H}{4}\right)m$
- $\left(\frac{4}{R_H}\right)m$
- $\left(\frac{R_H}{9}\right)m$
- $(9R_H)m$

75. The longest wavelength radiations in Brackett series have wavelength equal to

- $-\frac{25}{16}R_H$
- $\frac{16}{25}R_H$
- $\frac{135}{27R_H}$
- None

76. The wavelength of X – rays produced due to deceleration of electrons is

- $\lambda = \frac{V_0 e}{m}$
- $\lambda = \frac{he}{V_0 e}$
- $\lambda = \frac{h}{V_0 e}$
- $\lambda = \frac{V_0 e}{h}$



## Chapter 21 NUCLEAR PHYSICS

- In nucleus of uranium the number of neutrons will be \_\_\_\_\_
  - 92
  - 235
  - 143
  - Different for different isotopes
- During fusion of hydrogen into helium \_\_\_\_\_
  - Energy is absorbed
  - Energy is released
  - Mass is increased due to energy absorption
  - Mass is reduced due to energy absorption
- One a.m.u is equal to \_\_\_\_\_

- a)  $1.66 \times 10^{-27}$  kg    b)  $1.66 \times 10^{-25}$  kg  
c)  $1.66 \times 10^{-20}$  kg    d) All of above
4. According to which one of following law, the density of atom is uniform ?  
a) J.J. Thomson                      b) Rutherford's Model  
c) Bohr's Model                      d) All of above laws
5. For chain reaction to buildup, the size of the radio active target should be \_\_\_\_\_  
a. 90  
b. Greater than the critical size  
c. Less than the critical size  
d. Equal to critical size
6. Antimatter consists of \_\_\_\_\_  
a) Antiproton                          b) Antineutron  
c) Positron                            d) All of above
7. Neutron and proton are commonly known as \_\_\_\_\_  
a) Nucleons                            b) Meson  
c) Boson                                d) Quartz
8. Half life of Radium is 1590 years. In how many years shall the earth loss its radium due to radioactive decay  
a)  $1590 \times 10^6$  years                      b)  $1590 \times 10^{12}$  years  
c)  $1590 \times 10^{25}$  years                      d) Never
9. Which one of the following radiation possesses maximum penetrating power?  
a)  $\alpha$  - rays  
b)  $\beta$  - rays  
c)  $\gamma$  - rays  
d) All have equal penetrating power
10. Electrons  
a) Can exist inside the nucleus  
b) Cannot exist inside the nucleus  
c) Can exist both inside and outside the nucleus  
d) Don't know
11. Radioactivity is a \_\_\_\_\_  
a) Spontaneous activity  
b) Chemical property

- c) Self disintegration property  
d) Both a and c
12. Energy liberated when one atom of U-235 undergoes fission reaction is \_\_\_\_\_  
a) 200 Mev                              b) 40 Mev  
c) 30 Mev                                d) 20 Mev
13. Transuranic elements have atomic number \_\_\_\_\_  
a) Greater than 72                      b) Greater than 82  
c) Greater than 92                      d) Greater than 102
14. Nuclear force exist between  
a) Proton – proton                      b) Proton – Neutron  
c) Neutron – Neutron                      d) All of the above
15. Mass defect per nucleons is \_\_\_\_\_  
a. Binding energy of nucleus  
b. Packing fraction  
c. Average energy of nucleus  
d. All of above are one & same thing
16. Tick the correct statement  
a) Moderator slow down the neutron  
b) Moderator bring the neutrons to rest  
c) Moderator absorb the neutron  
d) Moderator reflect the neutron
17. The bombardment of nitrogen with  $\alpha$  - particles will produce \_\_\_\_\_  
a) Neutron                                b) Proton  
c) Electron                                d) Positron
18. Diameter of an atom is approximately \_\_\_\_\_  
a)  $10^{-12}$  m                                b)  $10^{-11}$  m  
c)  $10^{-10}$  m                                d)  $10^{-14}$  m
19. Radioactive decay obeys which one of the following data?  
a)  $N = N_0 e^{-\lambda t}$                               b)  $N = N_0 e^{xt}$   
c)  $N = N_0 e^{-xt/2}$                               d)  $N_0 = N(1e^{xt})$
20. Average energy required to remove one nucleon from the nucleus is called \_\_\_\_\_  
a) Binding energy per nucleon  
b) Energy of decay  
c) Destruction energy  
d) All of above

21. Fission chain reaction in a nuclear reactor can be controlled by introducing \_\_\_\_\_

- a) Iron rod                                      b) Graphite rods  
c) Cadmium rods                                d) Platinum rods

22. Which one of the following possesses maximum velocity?

- a)  $\alpha$  - rays  
b)  $\beta$  - rays  
c)  $\gamma$  - rays  
d) All of the above have same speed

23. Charge on an electron was determine by \_\_\_\_\_

- a) Ampere                                        b) Maxwell  
c) Milliken                                      d) Thomson

24. Charge on neutron is \_\_\_\_\_

- a)  $+1.6 \times 10^{-19} \text{C}$   
b)  $-1.6 \times 10^{-19} \text{C}$   
c) Zero  
d) No definite charge

25. A particle having the mass of an electron and the charge of a proton is called

- a) Antiproton                                    b) Positron  
c) Gamma rays                                d) Photon

26. Mass of neutron is \_\_\_\_\_

- a)  $1.67 \times 10^{-13} \text{ Kg}$                               b)  $1.67 \times 10^{-27} \text{ Kg}$   
c)  $9.1 \times 10^{-31} \text{ Kg}$                                 d)  $1.67 \times 10^{-19} \text{ Kg}$

27. Nuclei having the same mass number but different atomic number are \_\_\_\_\_

- a) Isotopes                                        b) Isobars  
c) Isotones                                        d) Isomers

28. A mass spectrograph sorts out \_\_\_\_\_

- a) Molecules                                    b) Ions  
c) Elements                                      d) Isotopes

29. Sum of the masses of constituent nucleons as compared to the mass of the resultant nucleus is \_\_\_\_\_

- a) Smaller  
b) Greater  
c) Same  
d) Sometimes smaller some times greater

30. An  $\alpha$  - particle is emitted from  ${}_{88}\text{Ra}^{226}$ , what is the mass and atomic number of the daughter nucleus?

	Mass Number	Atomic Number
a.	224	84
b.	220	80
c.	222	86
d.	226	87

31. The unit of Radioactivity "Curie" is equal to \_\_\_\_\_

- a)  $3.74 \times 10^9$  disintegration per sec  
b)  $3.70 \times 10^{10}$  disintegration per sec  
c)  $3.55 \times 10^{10}$  disintegration per sec  
d)  $3.60 \times 10^{10}$  disintegration per sec

32. During fission process, a large amount of \_\_\_\_\_

- a) Heat energy is released  
b) Nuclear energy is released  
c) Chemical energy is released  
d) Light energy is released

33. In liquid metal fast breeder reactor, the type of uranium used is \_\_\_\_\_

- b)  ${}_{92}\text{U}^{238}$   
d)  ${}_{92}\text{U}^{239}$

34. Radioactive materials can be identified by measuring their \_\_\_\_\_

- a) Hardness                                      b) Density  
c) Mass    d) Half life

35. If one or more of the neutrons emitted during fission can be used to build up further fission then the reaction is self sustained and is known as \_\_\_\_\_

- a) Fission reaction                              b) Fusion reaction  
c) Chain reaction                                d) Chemical reaction

36. Pair production takes place in the vicinity of heavy nucleus so that \_\_\_\_\_

- a) Net energy is conserved  
b) Net charge is conserved  
c) Net momentum is conserved  
d) All of the above

37. During an encounter with an atom  $\alpha$  - particle knocks out \_\_\_\_\_





- a) Protons                      b) Electrons  
c) Neutrons                    d) Nothing
38. The path of B-particle is \_\_\_\_\_  
a) Rectilinear                  b) Carved  
c) Zigzag or erratic          d) Elliptical
39. Which one of the following radiations are suitable for the treatment of an infection in the interior body?  
a)  $\alpha$  - rays                      b)  $\beta$  - rays  
c)  $\gamma$  - rays                      d) X - rays
40. Various types of cancer are treated by \_\_\_\_\_  
a) Cobalt 60                      b) Strontium – 90  
c) Carbon 14                    d) Nickel – 63
41. Sterilizations of surgical instrument, medical supplies and bandages can be done by exposing them to a beam of \_\_\_\_\_  
a)  $\alpha$  - rays  
b)  $\beta$  - rays  
c)  $\gamma$  - rays  
d) 'b' & 'c' have equal antiseptic properties
42. Charge on  $\alpha$  - particle is \_\_\_\_\_  
a) +1                              b) +2  
c) -2                              d) -1
43. B-particle ionizes an atom \_\_\_\_\_  
a) Through direct collision  
b) Through electrostatic attraction  
c) Through electrostatic repulsion  
d) All of above
44. T.V. sets and microwave oven emit \_\_\_\_\_  
a) X - rays                      b)  $\alpha$  - rays  
c)  $\beta$  - rays                      d)  $\gamma$  - rays
45. A  $\beta$  - particle in a single encounter \_\_\_\_\_  
a) Loses a small fraction of its energy  
b) Loses most of its energy  
c) Loses no energy at all  
d) Loses energy at all
46. Strontium -90 is used as \_\_\_\_\_  
a)  $\beta$  - particle source              b)  $\alpha$  - particle source  
c)  $\gamma$  - particle source              d) Neutrons source
47. The penetration power of  $\beta$  - particle as compared to a-particle is \_\_\_\_\_  
a) 10 times more                  b) 100 times more  
c) 100 times less                  d) 10 times less
48. Geiger counter is suitable for \_\_\_\_\_  
a) Fast counting                  b) Extremely fast counting  
c) Slow counting                  d) All situations
49. A  $\alpha$  - particle can produce fluorescence in \_\_\_\_\_  
a) Zns                              b) Barium Palatino cyanide  
c) Calcium tunzstate          d) All of above
50. Pair production cannot take place in vacuum as \_\_\_\_\_ is not conserved  
a) Energy                          b) Charge  
c) Mass                              d) Momentum
51. CFC is used in \_\_\_\_\_  
a) Refrigerator                      b) Aerosol spray  
c) Plastic foam industry          d) All of above
52. Average distance covered by  $\alpha$  - particle in air before its ionizing power ceases is called its \_\_\_\_\_  
a) Trajectory                      b) Range  
c) Firing level                      d) Limit
53. Which one of the following possesses greater penetrating power?  
a)  $\alpha$  - rays                      b)  $\beta$  - rays  
c) X-rays                          d) Neutron
54. The most useful tracer is \_\_\_\_\_  
a) Sr -90                          b) I -131  
c) Ca -41                          d) C -14
55.  $\gamma$  - rays are electromagnetic waves like \_\_\_\_\_  
a) Normal light                  b) Heat waves  
c) Micro waves                  d) X - rays
56. Charge on B-particle is \_\_\_\_\_



- a) +1                      b) -1  
c) +2                      d) -2
57. Why  $\gamma$  - rays are used to kill bacteria, to sterilize surgical equipments etc?
- a) Chargless                      b) Massless  
c) Highly penetrating                      d) All of above
58. B-particle ionizes an atom \_\_\_\_\_
- a) Due to electrostatic force of attraction  
b) Due to electrostatic force of repulsion  
c) Due to direct collision  
d) Due to gravitational force
59. B-particles possess greater penetration power then that of a-particle due to its \_\_\_\_\_
- a) Smaller ionization power  
b) Energy is not conserved  
c) Neither greater nor smaller ionization power  
d) Same ionization power
60. Pair production can take places only with \_\_\_\_\_
- a) X-rays                      b)  $\gamma$  - rays  
c) UV-rays                      d) IR-rays
61. A device for producing high energy nuclei \_\_\_\_\_
- a) Cloud chamber                      b) Linear acceleration  
c) A mass spectrograph                      d) Wilson cloud
62. Which one of the following will be better shield against  $\gamma$  - rays?
- a) Ordinary water                      b) Heavy water  
c) Lead                      d) Aluminum
63. The maximum safe limit does for persons working in nuclear power station are \_\_\_\_\_
- a) 1 rem per week                      b) 5 rem per week  
c) 4 rem per week                      d) 3 rem per week
64. Radiations are used for the treatment of skin of a patient is \_\_\_\_\_
- a)  $\alpha$  - rays                      b)  $\beta$  - rays  
c) X - rays                      d)  $\gamma$  - rays

65. Strong nuclear force
- a) Increase with magnitude of increasing charge  
b) Decreases with magnitude of increasing charge  
c) Is independent of charge  
d) None
66. Complete the reaction  
$${}_Z X^A \rightarrow {}_{Z+1} X^A + {}_0^0 \beta^+ + \dots + Q$$
- a) Neutrino                      b) Antineutrino  
c)  $\alpha$  - particle                      d) None
67. Both Xenon and Cesium each have isotopes
- a) 12                      b) 33  
c) 36                      d) 39
68. Marie Curie and Pierre Curie discovered two new radioactive elements which
- a) Uranium and Polonium  
b) Polonium and Radium  
c) Radium and Uranium  
d) Uranium and Plutonium
69. The half of uranium – 238 is
- a)  $4.6 \times 10^8$  years                      b)  $3.3 \times 10^9$  years  
c)  $4.5 \times 10^8$  years                      d)  $4.5 \times 10^9$  years
70. The  $\alpha$  - particle ionizes the particles in its way and adopt the path which is
- a) Curved                      b) Straight  
c) Zig – Zag                      d) None of these
71.  $\beta$  - particles can be deflected by collisions than the  $\alpha$  -particles is
- a) Difficult                      b) Very easily  
c) Easily                      d) None of these
72. Neutron interact with materials containing hydrogen atoms and knock out
- a) Electron                      b) Proton  
c) Photon                      d) None of these
73. Neutron produce ionization by knocking out proton which is
- a) Direct ionization                      b) Indirect ionization  
c) Both                      d) None of these

74.  $\gamma$  - rays are absorbed by a sheet of
- a) 1 ~ 5 mm of lead      b) 1 ~ 10 mm of lead  
c) 5 ~ 10 mm of lead      d) None of these
75. Tracks obtained by  $\beta$  - particles in Wilson Cloud Chamber is
- a) Strong Continuous  
b) Discontinuous, not straight thin  
c) Weak and no definite tracks  
d) None of these
76. The mixture of gas filled in a Geiger-Muller tube at atmospheric pressure at about
- a) 0.01 mm of Hg      b) 0.1 mm of Hg  
c) 10.00 mm of Hg      d) None of these
77. The quenching of gas by a quenching gas is called
- a) Quenching      b) Self quenching  
c) Forced quenching      d) None of these
78. The dead time of Geiger Muller counter is of the order of
- a) Micro second      b) Milli second  
c) More than millisecond      d) None of these
79. As the solid state detector absorbs less energy of the incident particle and junction is close to the surface. So it is called the detector as
- a) Surface contact      b) Surface barrier  
c) Surface dependent      d) None of these
80. The solid state detector operated at
- a) Low      b) High  
c) Very High      d) None of these
81. The breakage of  $^{235}_{92}\text{U}$  produces the fragments as
- a) Kr and Ba      b) Sn and Mo  
c) Xe and Sr      d) All of them
82. The fuel / fuels used in the reactor are nowadays
- a) Plutonium – 239      b) Uranium – 233  
c) Uranium – 235      d) All of these
83. The temperature of the core of the reactor rises to about
- a) 1000°C      b) 1100°C  
c) 1200°C      d) 1300°C
84. Plutonium can be fissioned by
- a) Slow neutron      b) Fast neutron  
c) Very slow neutron      d) None of these
85. Ultraviolet radiation cause
- a) Sun burn      b) Blindness  
c) Skin Cancer      d) All of them
86. Neutrons are particularly more damaging to
- a) Legs      b) Heart  
c) Eyes      d) Brain
87. Radio isotopes can be made easily by bombardment with
- a) Electrons      b) Protons  
c) Neutrons      d) None of these
88. Subatomic particles are divided into
- a) Photons      b) Leptons  
c) Hadrons      d) All of these
89. Hadrons are the particle included
- a) Electrons      b) Neutrons  
c) Mesons      d) All of these
90. Lepton's particles which experience no strong nuclear force are
- a) Electrons      b) Muons  
c) Neutrinos      d) All of these
91. The charges on the quarks are
- a) One unit      b) Half unit  
c) Fraction      d) None of these
92. Meson is made from
- a) A pair of quarks  
b) A pair of anti quarks  
c) A pair of quarks and anti quarks  
d) None of these
93. Fission nuclear reaction leads to a \_\_\_\_\_ stability.
- a) Lesser      b) Greater  
c) Medium      d) None

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94. If a radioactive isotope of silver have a half life of about 7.5 days. After 15 days the remaining isotope of its original is

- a) 25%
- b) 50%
- c) 7.5%
- d) 15%

95. A nuclide  ${}_{86}R^{220}$  decays to a new nuclide by two  $\alpha$  -emissions, the nuclide S is

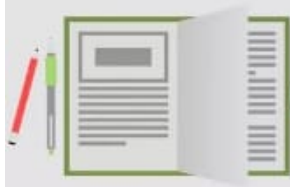
- a)  ${}_{84}S^{212}$
- b)  ${}_{82}S^{212}$
- c)  ${}_{80}S^{220}$
- d) None



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